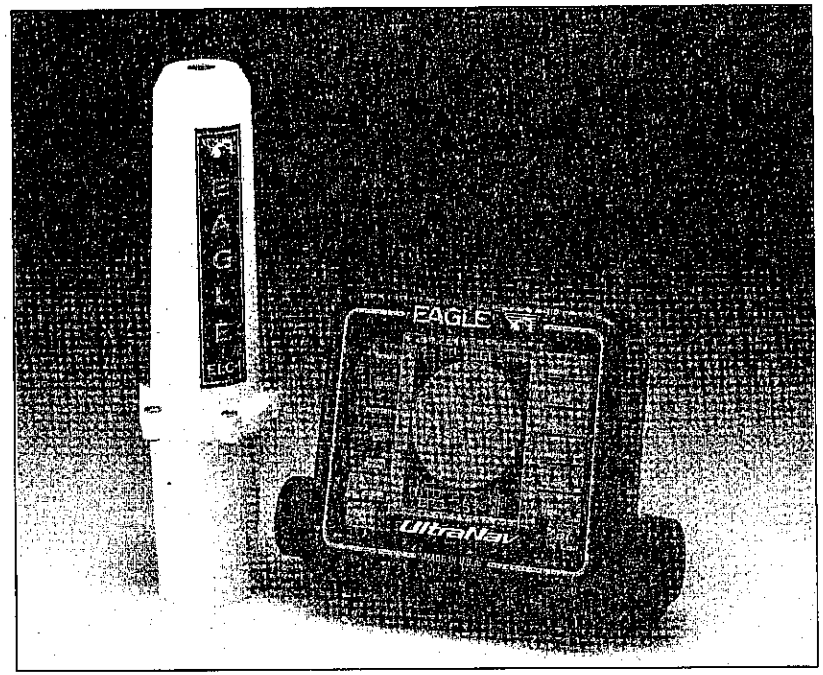

UltraNav

INSTALLATION AND OPERATION INSTRUCTIONS

EAGLE™

LITHO IN U.S.A.

988-0106-39A

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NOTES:

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NOTES:

SONAR TABLE OF CONTENTS

INTRODUCTION 1
MOUNTING 1
POWER CONNECTIONS 2
TRANSDUCER 4
KEYBOARD BASICS 4
DISPLAY 6
OPERATION 7
AUTOMATIC 7
SENSITIVITY 7
GRAYLINE® 9
RANGE 10
ZOOM-AUTOMATIC 11
ZOOM-MANUAL 12
ALARMS 12
FISH ALARM 13
ZONE ALARM 14
DEPTH ALARM 15
AUDIO ALARM ON/OFF 16
MENUS 17
CHART SPEED 17
FISH I.D. 18
CHART CURSOR 19
FASTRAK 20
DIGITAL DISPLAYS 20
DIGITAL SIZE 21
UNIT OF MEASURE 22
BACKLIGHTS 23
SPEAKER VOLUME 23
DISPLAY CONTRAST 24
DIGITAL SONAR 24
NOISE REJECTION 25
ASP 26
SURFACE CLARITY CONTROL (SCC) 27
DISPLAY ZONE BAR 28
DISPLAY ZOOM BAR 28
TRANSDUCERS AND CONE ANGLES 29
SIGNAL INTERPRETATION 30
FISH ARCHES 31
WATER TEMPERATURE AND THERMOCLINES 32
SURVEYING A LAKE 34
BAIT FISH 34
SONAR TROUBLESHOOTING 35
HOW TO OBTAIN SERVICE 38
LORAN SECTION 39

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All features and specifications subject to change without notice.
All screens in this manual are simulated.

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NOTES:

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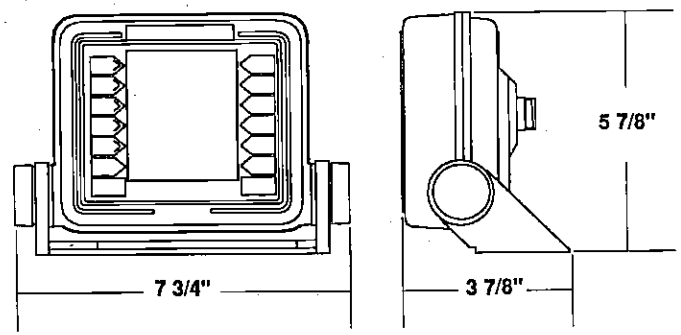
NOTES:

INTRODUCTION

The UltraNav represents one of the best values in sportfishing sonar today. It rivals other sonar units costing much more in features and performance. With its menus, the UltraNav offers easy-to-use operation at the touch of a button. The screen shows the underwater world with high resolution and detail. The UltraNav also displays digital depth, boat speed, surface water temperature, and distance travelled (distance log) if the optional speed/temperature sensor (model EST-T) is attached.

Although the UltraNav has many features and functions, the "soft key" menu system makes it easy to use. Above all, don't be afraid to try different features and functions on the unit. You can't hurt it by pressing buttons!

Read this manual and take it with you the first few times you use your unit. It makes a great reference should you need it. The more you know when you get to the water, the more your UltraNav can do for you!



MOUNTING

Install the UltraNav in any convenient location, provided there is clearance behind the unit when it is tilted for the best viewing angle. Holes in the bracket base allow wood screw or through-bolt mounting. You may need to place a piece of plywood on the back of thin fiberglass panels to secure the mounting hardware. Make certain there is enough room behind the unit to attach the power and transducer cables.

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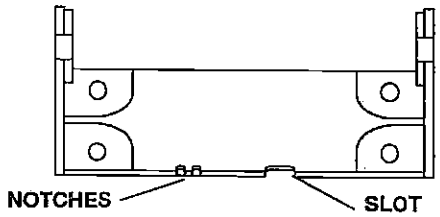
The smallest hole that will pass one power or transducer plug is one inch. After the hole is drilled, pass the transducer connector up through the hole first, then pass the power cable down through it.

After the cables have been routed, fill the hole with a good marine sealing compound. Offset the bracket to cover the hole. Route the power cable through the slot and break out one of the other slots in the bracket for the transducer cable.

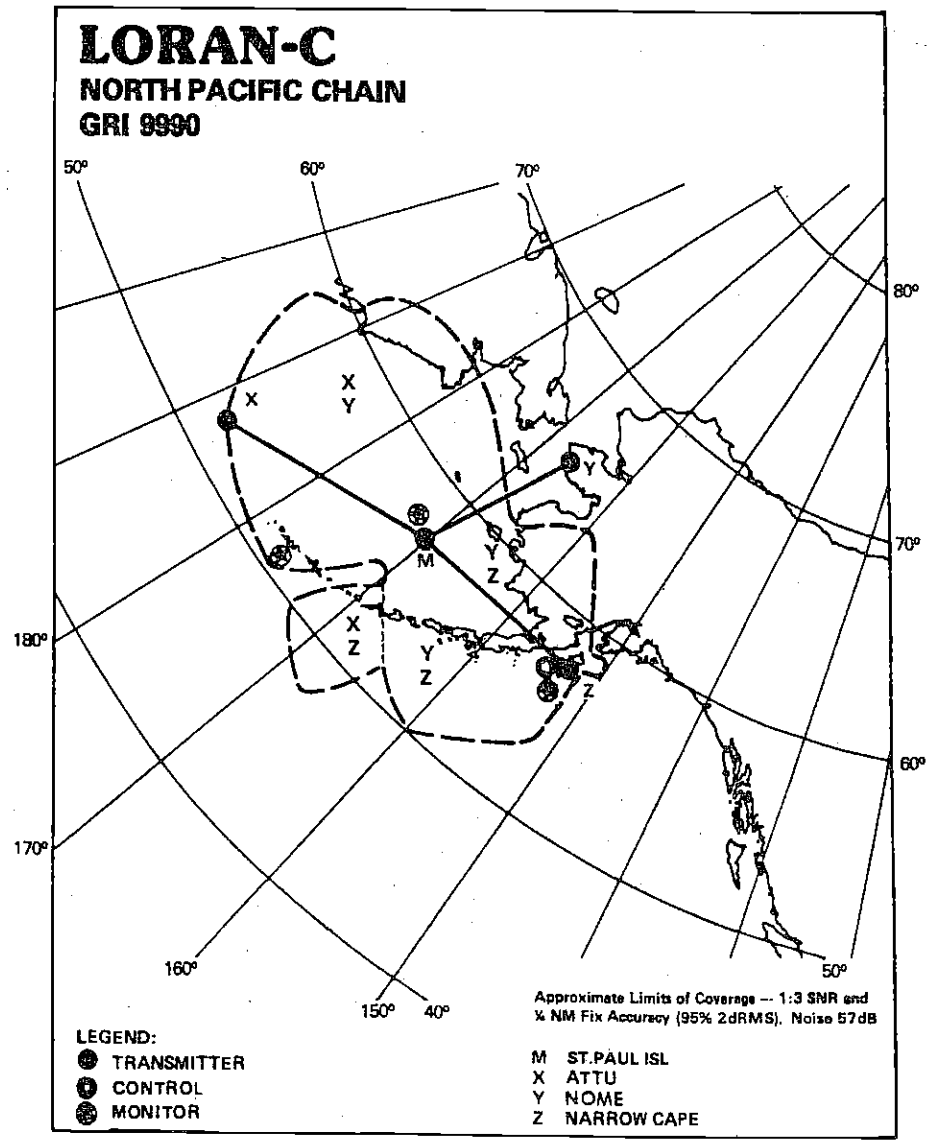


POWER CONNECTIONS

The UltraNav works from a twelve-volt battery system only. For the best results, attach the power cable directly to the battery. You can attach the power cable to an accessory or power buss, however you may have problems with electrical interference. Therefore, it's safer to go ahead and attach the power cable directly to the battery. If the cable is not long enough, splice #18 gauge wire onto it.Attach the in-line fuse holder to the red lead as close to the power source as possible. For example, if you have to extend the power cable to the battery or power buss, attach one end of the fuse holder directly to the battery or power buss. This will protect both the unit and the power cable in the event of a short.

The power cable has three wires, red, white, and black. Red is the positive lead, black is negative or ground. The white wire is used for the NMEA interface. To use this feature, attach a shielded, twisted pair cable from the autopilot or other marine equipment's NMEA interface to the white wire on the UltraNav's power cable. Solder the twisted pair's ground wire and shield wire to the black wire on the NavGuide's power cable. Do not connect the shield wire to the autopilot. See your autopilot's manual for more instructions. If you're not going to use this feature, cut and tape the white wire to prevent a short.

Minimize electrical noise by routing the power cable away from other possible sources of electrical interference. One of the largest noise generators is the engine's wiring harness. For best results, keep the power and transducer cables away from the engine wiring.



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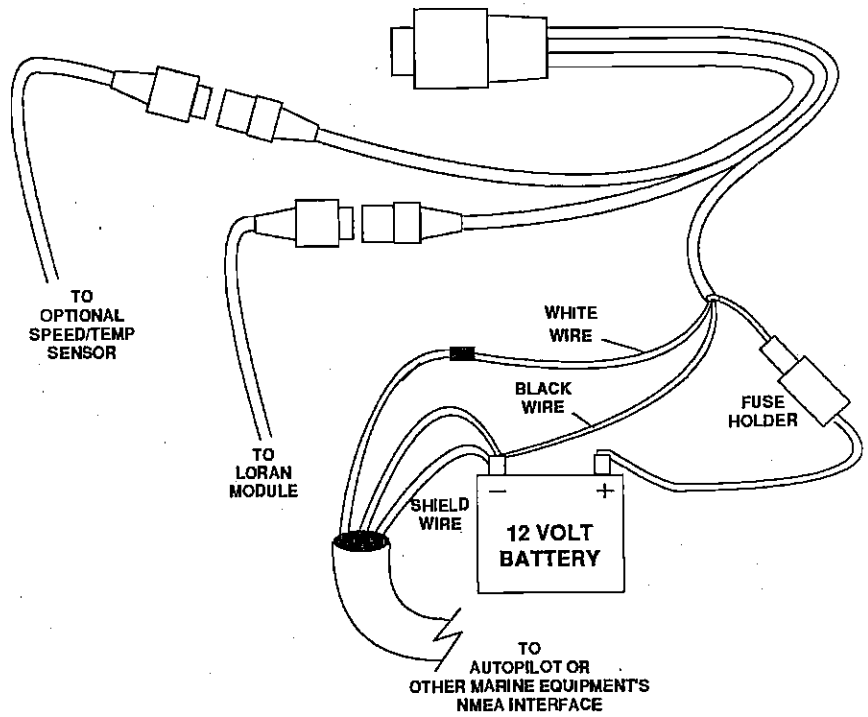
NORTH PACIFIC LORAN-C CHAIN GR1 9990
REGIONAL MANAGER COMMANDER, PACIFIC AREA, ALAMEDA, CA
CHAIN MANAGER: COMMANDER, 17TH COAST GUARD DISTRICT, JUNEAU, AK
COORDINATOR OF CHAIN OPERATIONS LOCATION: LORMONSTA KODIAK, AK
CONTROL SITE: LORMONSTA KODIAK, AK

DESIG.	STATION	COOR.	CD/BLL (us)	XMITTER	PWR (KW)	TRANSMIT ANTENNA	NOM ECD	NOTES
MASTER	ST. PAUL AK	57 09 12.3N 170 15 06.6W		AN/FPN-42	325	625 FT MONOPOLE	0.0	
XRAY	ATTU AK	52 49 44.0N 173 10 49.0E	11000/ 3675.25	AN/FPN-42	325	625 FT MONOPOLE	0.0	
YANKEE	PORT CLARENCE AK	65 14 40.3N 166 53 12.6W	29000/ 3068.95	AN/FPN-42	1000	1350 FT MONOPOLE	+0.6	
ZULU	NARROW CAPE, AK	57 26 20.2N 152 22 11.3W	43000/ 3590.45	AN/FPN-44A	400	625 FT MONOPOLE	0.0	DUAL RATE W/GRI7960



The UltraNav has reverse polarity protection. No damage will occur to the unit if the power wires are hooked up backwards. However, it won't work until the wiring is connected properly.

Attach the loran module's cable to the UltraNav's power cable. Tags on the cables identify both the loran and the optional speed/temperature sensor's connector. See the loran section in this manual for loran module installation.

NOISE

Bilge pumps and their wiring can also radiate noise, so keep the cables away from them, if possible.

VHF radio antennas and cables radiate RF energy at high power levels. It is important to keep the power and transducer cables away from them, also. See the sonar troubleshooting section for tips on preventing noise problems.

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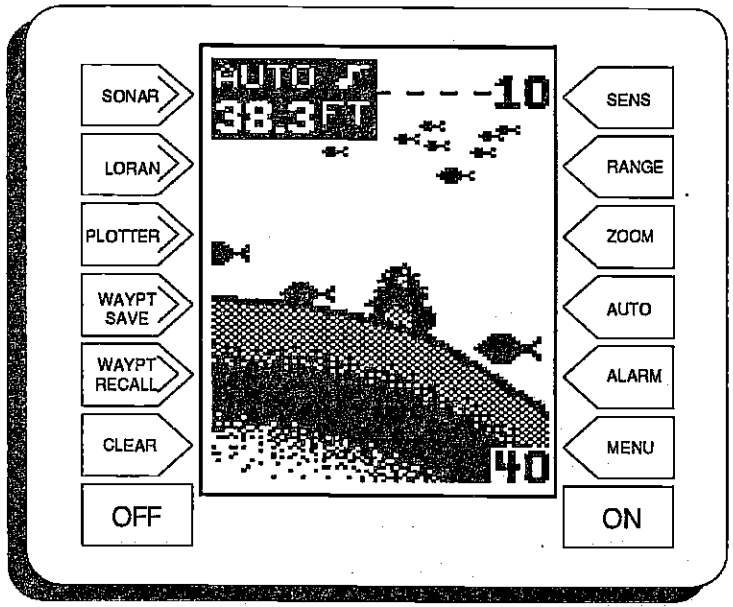
TRANSDUCER CONNECTIONS

See the transducer owner's manual included with the unit for transducer installation instructions.

KEYBOARD

The keyboard has keys arranged in two vertical columns. The keys in the left column are used to switch the unit between sonar, loran, and plotter modes, plus menu selections. The keys in the right column pertain to the basic sonar functions. The menu key in the bottom right corner of the keyboard activates the first menu page.



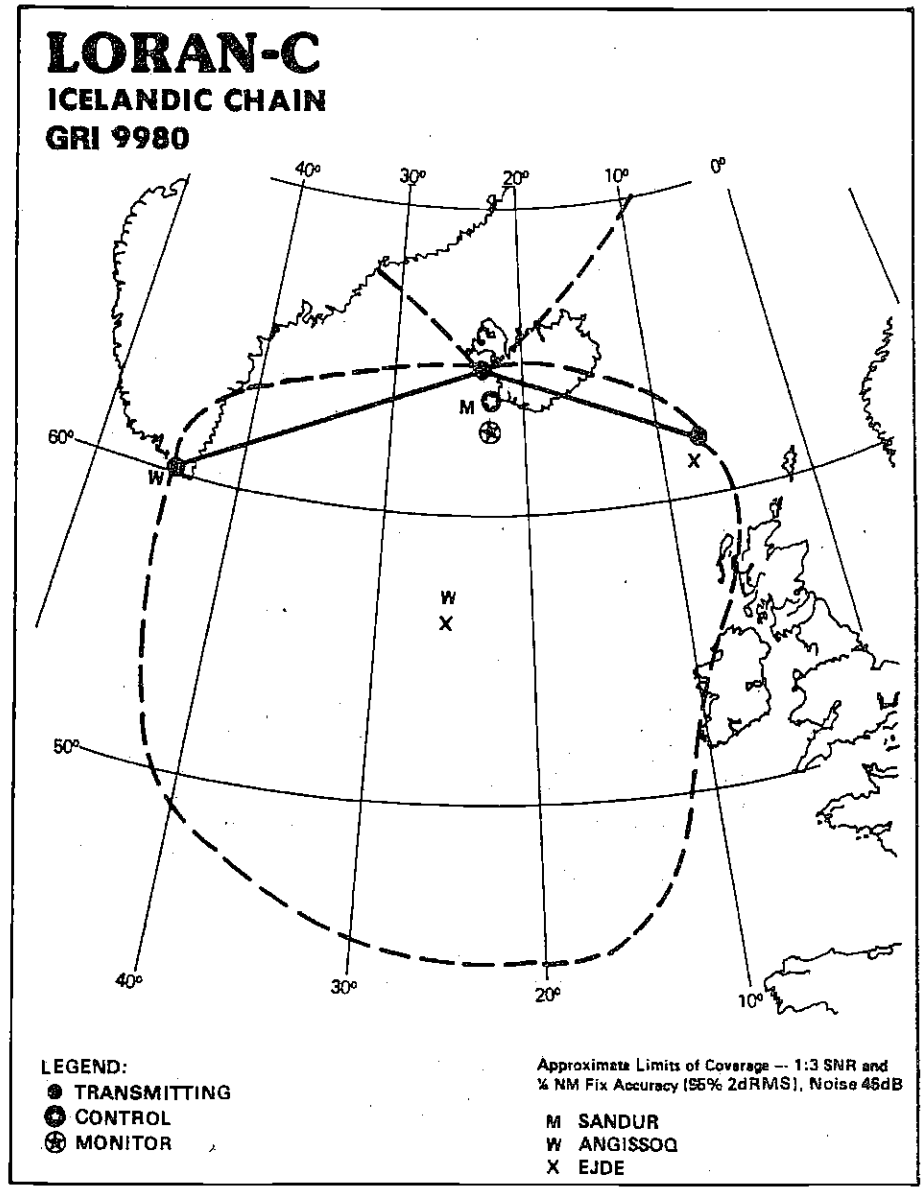
SENS - Press this key to adjust the unit's sensitivity and Grayline.

RANGE - This key lets you adjust the range when the unit is in the manual mode.

ZOOM - The Ultra gives you 2X and 4X zoom capability with this key.

AUTO - This turns the automatic feature off and on.

ALARM - Activate and adjust the alarms through this key.



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ICELANDIC LORAN-C CHAIN GR1 9960
REGIONAL MANAGER, COMMANDER COAST GUARD ACTIVITIES EUROPE, LONDON, UK
CHAIN MANAGER COMMANDER COAST GUARD ACTIVITIES EUROPE, LONDON, UK
COORDINATOR OF CHAIN OPERATIONS LOCATION LORMONSTA KEFLAVLK, ICELAND
CONTROL SITE: LORMONSTA KEFLAVIK, ICELAND

DESIG.	STATION	COOR.	CD/ELL (us)	XMITTER	PWR (KW)	TRANSMIT ANTENNA	NOM ECD	NOTES
MASTER	SANDUR ICELAND	64 54 26.6N 23 55 21.6W		AN/FPN-45	1500	1350FT MONOPOLE	0.0	
WHISKEY	ANGISSOQ GREENLAND	59 59 17.3N 45 16 27.5W	11000/ 4056.03	AN/FPN-45 MONOPOLE	760	625 FT	+1.0	DUAL RATE W/GRI7930
XRAY	EJDE,FAEROE IS.,DENMARK	62 17 59.6N 07 04 26.5W	30000/ 2944.54	AN/FPN-44 MONOPOLE	325	625 FT	0.0	DUAL RATE GRI7970

MENU - Press this key to show the menus and gain access to most functions.

ON - The ON key turns the Ultra on.

OFF - The Off key turns the Ultra off.

SONAR - This key switches the UltraNav from the loran mode to the sonar mode.

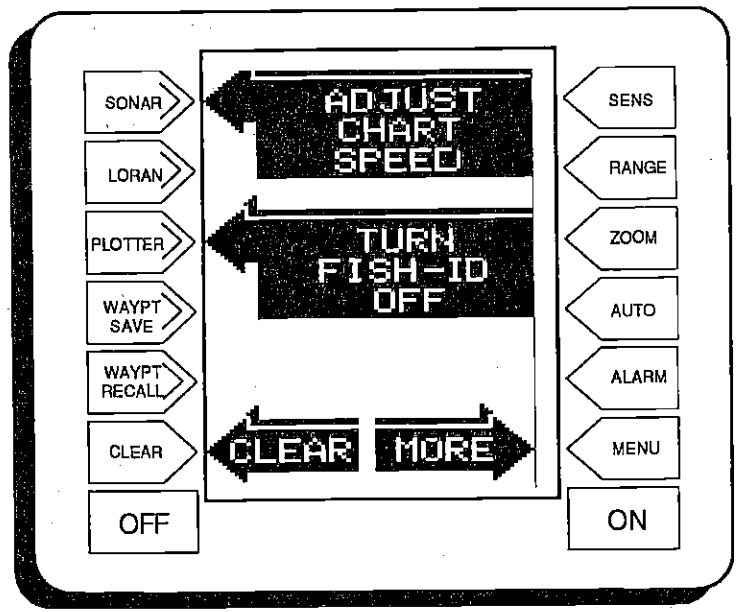
LORAN - Press this key to switch to the loran mode.

PLOTTER - The plotter appears when this key is pressed.

WAYPT SAVE - Press this key to save a waypoint.

WAYPT RECALL - This key activates the waypoint recall menus.

Note: The Sonar, Loran, Plotter, Waypoint Save and Waypoint Recall keys are also used as "soft keys" or feature select keys. When a menu selection arrow points to one of these keys, the key activates the menu feature, not the feature printed on the key. For example, if you press the PLOTTER key as shown below, the Fish ID feature will be turned off.



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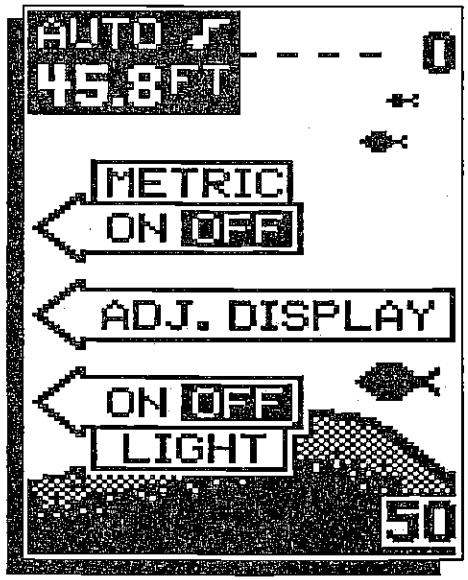


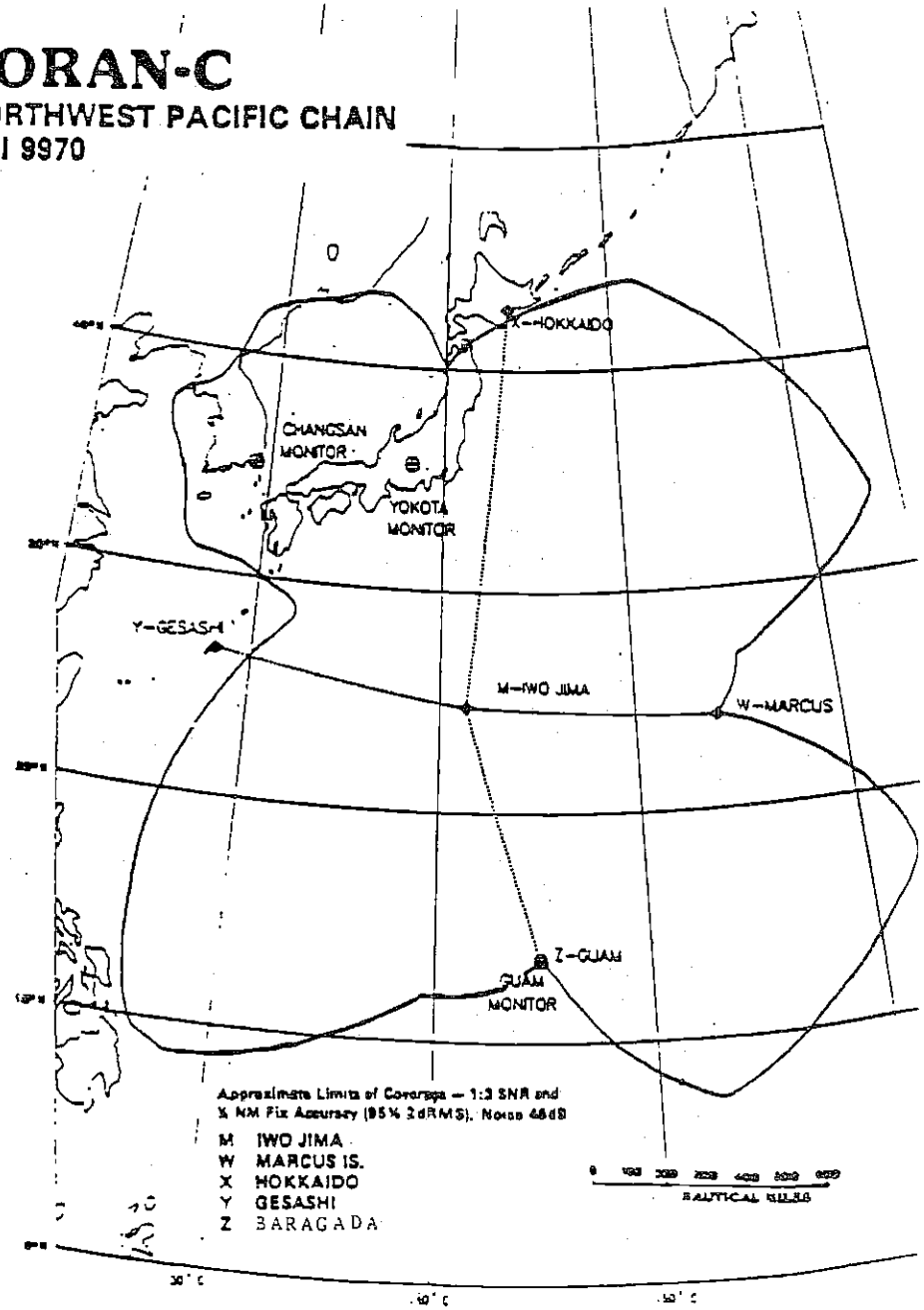
DISPLAY - General

The lights are turned on for approximately ten seconds when the Ultra is first turned on. Menus appear at the same time. To keep the lights on, press the key adjacent to the Light label. It controls the backlighting used on the display and keyboard. If you don't want the lights on, wait ten seconds and the lights will automatically turn themselves off. The menus will also disappear after ten seconds, or you can turn them off by pressing the key adjacent to the CLEAR key at the bottom of the screen.

The Metric label at the top of the screen works the same way. Press the key adjacent to the Metric label to change the depth from feet to meters. This also changes the temperature display to degrees Celsius, speed to knots, and log to kilometers on the Ultra Plus.

The ADJ Display label lets you adjust the display's contrast for the best viewing angle. Pressing this key gives you the contrast adjust menu. See the Display Contrast section for more information on this feature.

When the UltraNav is first turned on, the display will appear similar to the one below. The word "AUTO" in the upper center of the display indicates the automatic feature is on. A small note symbol next to the "AUTO" indicator means the alarm speaker is enabled. The digital bottom depth is displayed immediately beneath the AUTO indicator.



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NORTHWEST PACIFIC LORAN-C CHAIN GR1 9970
REGIONAL MANAGER COMMANDER. PACIFIC AREA, ALAMEDA, CA.
CHAIN MANAGER COMMANDER, 14TH COAST GUARD DISTRICT, HONOLULU, HI
COORDINATOR OF CHAIN OPERATIONS LOCATION. COMMANDER, FAR EAST SECTION. YOKOTA, JAPAN
CONTROL SITE LORMONSTA YOKOTA, JAPAN

DESIG.	STATION	COOR.	CD/BLL (us)	XMITTER	PWR (KW)	TRANSMIT ANTENNA	NOM ECD	NOTES
MASTER	IWOJIMA JAPAN	24 48 03.6N 141 19 30.3E		AN/FPN-45	1815	1350 FT MONOPOLE	0.0	
WHISKEY	MARCUS ISLAND JAPAN	24 17 07.9N 153 58 53.2E	11000/ 4283.98	AN/FPN-45	2160	1350 FT MONOPOLE	0.0	
XRAY	HOKKAIDO JAPAN	42 44 37.1N 143 43 09.2E	30000/ 6665.17	AN/FPN-45	600	625 FT MONOPOLE	0.0	DUAL RATE W/GRI5970
YANKEE	GESASHI JAPAN	26 36 25.0N 128 08 56.4E	65000/ 4453.29	AN/FPN-45	600	625 FT MONOPOLE	0.0	DUAL RATE W/GRI5970
ZULU	BARRIGADA	13 27 50.1N 144 49 33.0E	2536.84/ 61000			760 FT		

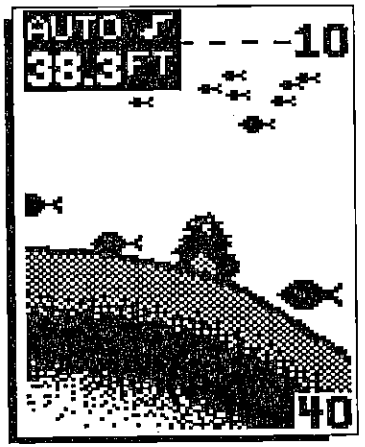
CVISION TECHNOLOGIES

SONAR OPERATION

AUTOMATIC

When the UltraNav is first turned on, the Automatic feature is enabled. This is indicated by the word "AUTO" at the top of the screen. The Automatic feature adjusts the sensitivity and range so the bottom signal is displayed in the lower half of the screen at all times.

To turn Automatic off, simply press the AUTO key. The letters "Man" appears, indicating the unit is in the manual mode. To turn Automatic on, press the AUTO key again.



SENSITIVITY

The sensitivity key on the UltraNav controls the ability of the unit to pick up echoes. A low sensitivity level excludes much of the bottom information, fish signals, and other target information. High sensitivity levels enables you to see this detail, but it can also clutter the screen with noise. Typically, the best sensitivity level shows a good solid bottom signal with Grayline and some surface clutter.

When the UltraNav is in the Automatic mode, the sensitivity is automatically adjusted to keep a solid bottom signal displayed, plus a little more. This gives it the capability to show fish and other detail.

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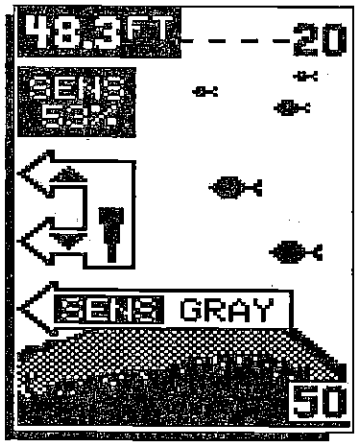


However, situations occur where it becomes necessary to increase or decrease the sensitivity. This typically happens when you wish to see more detail, so an increase in sensitivity is indicated. The procedure to adjust it is the same whether the unit is in the automatic or manual mode.

To adjust the sensitivity, press the SENS key. The sensitivity adjust menu appears on the left side of the screen. The switch for the Grayline adjust menu is immediately beneath it.

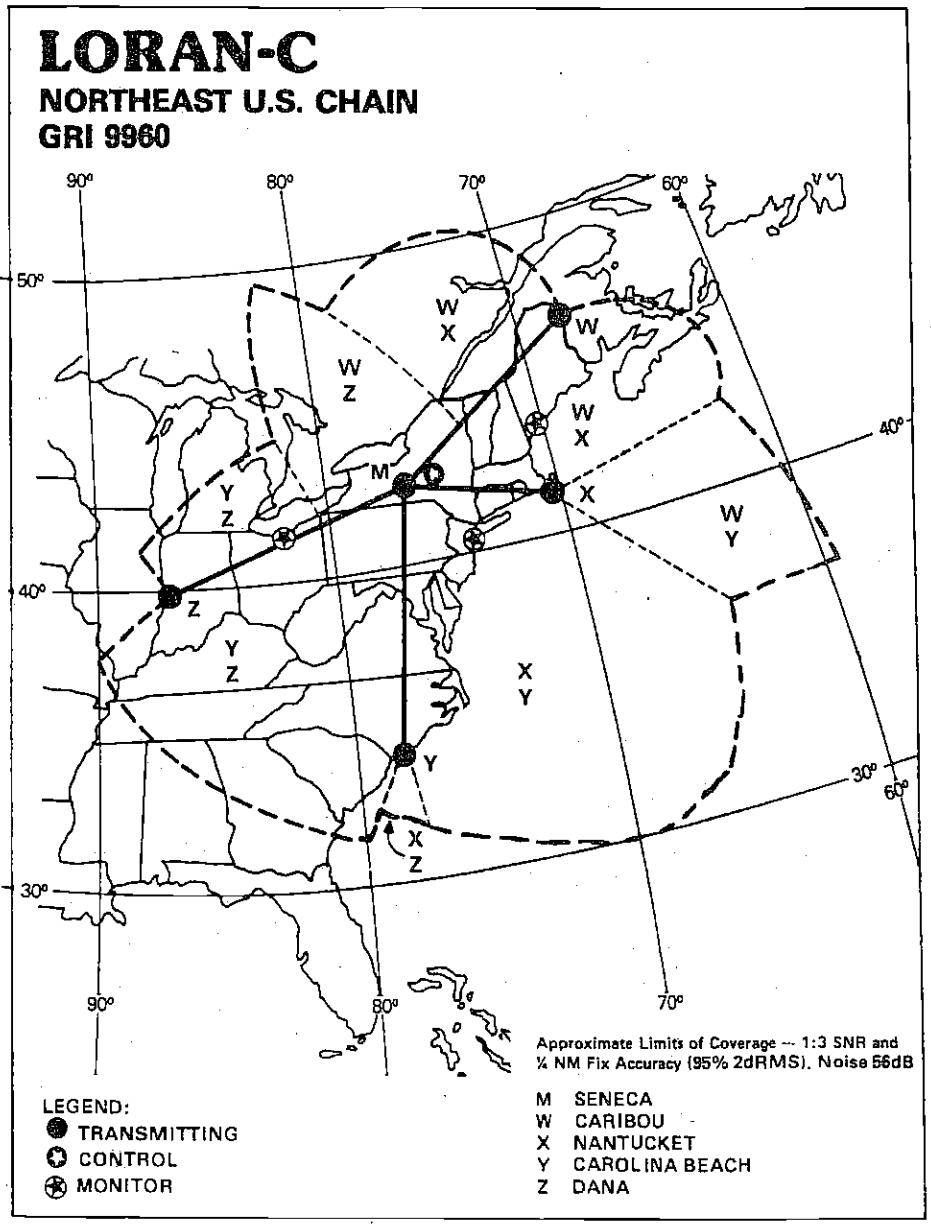
The sensitivity menu has up and down arrows, plus a vertical bar graph. The graph gives a visual indication of the sensitivity level. The number above the up arrow also shows the percentage of sensitivity in use.

To increase the sensitivity level, press the key adjacent to the menu's up arrow on the left side of the unit. As you press the key, the menu's bar graph will grow taller and the percentage will increase in value. You can also see the difference on the chart record as it scrolls. When the sensitivity is at the desired level, release the key.

To decrease the sensitivity level, press the key adjacent to the down arrow. The bar graph and percentage will decrease. When the sensitivity is at the desired level, release the key.

When you reach either the maximum or minimum limit, the speaker will sound an alert tone.

To turn the menus off, press the key adjacent to the CLEAR key at the bottom left side of the unit.



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NORTHEAST U.S. LORAN-C CHAIN GRI 9960
REGIONAL MANAGER COMMANDER, ATLANTIC AREA. NEW YORK, NY
CHAIN MANAGER COMMANDER, ATLANTIC AREA, NEW YORK, NY
COORDINATOR OF CHAIN OPERATIONS LOCATION: LORSTA SENECA, NY
CONTROL SITE: LORSTA SENECA, NY

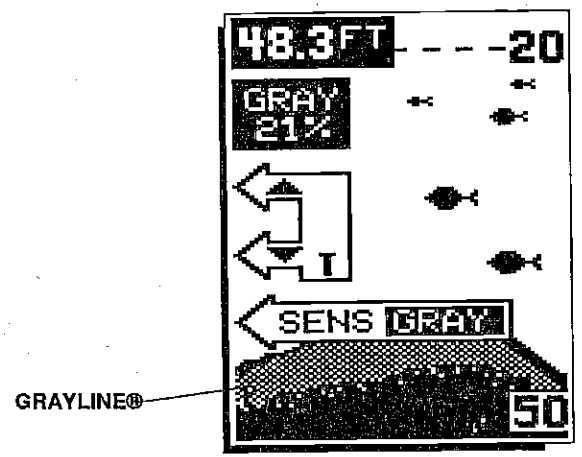
DESIG.	STATION	COOR.	CD/BLL (us)	XMITTER	PWR (KW)	TRANSMIT ANTENNA	NOM ECD	NOTES
MASTER	SENECA, NY	42 42 50.6N 76 49 33.9W		AN/FPN-64 (56 HCG'S)	800	700 FT MONOPOLE	0.0	DUAL RATE W/GRI 8970
WHISKEY	CARIBOU, ME	46 48 27.2N 67 55 37.7W	11000/ 2797.20	AN/FPN-42	350	SLT	0.0	DUAL RATE W/GRI 5930
XRAY	NANTUCKET MA	41 15 11.9N 69 56 39.1W	25000/ 1959.93	AN/FPN-42	325	625 FT MONOPOLE	0.0	DUAL RATE W/GRI 5930
YANKEE	CAROLINA BEACH, NC	34 03 46.1N 77 54 46.7W	39000/ 3221.64	AN/FPN-42	550	TIP	0.0	DUAL RATE W/GRI 7960
ZULU	DANA IN	39 51 07.5N 87 29 12.1W	54000/ 3162.06	AN/FPN-44	400	625 FT MONOPOLE	-0.5	DUAL RATE W/GRI 8970

GRAYLINE®

GRAYLINE® lets you distinguish between strong and weak echoes. It "paints" gray on targets that are stronger than a preset value. This allows you to tell the difference between a hard and soft bottom. For example, a soft, muddy or weedy bottom returns a weaker signal which is shown with a narrow or no gray line. A hard bottom returns a strong signal which causes a wide gray line.

If you have two signals of equal size, one with gray and the other without, then the target with gray is the stronger signal. This helps distinguish weeds from trees on the bottom, or fish from structure.

GRAYLINE® is adjustable. Since GRAYLINE® shows the difference between strong and weak signals, adjusting Sensitivity may require a different GRAYLINE® level, also. The level chosen by the Ultra at power on is usually adequate for most conditions. Experiment with your unit to find the GRAYLINE® setting that's best for you.



To adjust GRAYLINE®, press the SENS key. The sensitivity menu appears in the upper left side of the display, while the GRAYLINE® switch label appears immediately beneath it. First press the key adjacent to the "SENS GRAY" label. This changes the sensitivity adjust menu to GRAYLINE® adjust. Now press the key adjacent to the up arrow to increase the gray level. Press the key adjacent to the down arrow to decrease it. The percentage of GRAYLINE® in use changes as the arrow keys are pressed. The bar chart also gives a graphical indication of the GRAYLINE® level. You can see the change on the screen (both on the menu and on the chart record) as

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you press the keys. After you've made the adjustment, press the key adjacent to the CLEAR key to erase the menu.

RANGE - Automatic

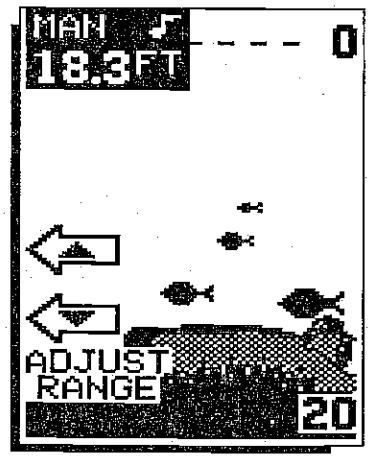
When turned on for the first time, the UltraNav automatically places the bottom signal in the lower half of the screen. This is called Auto Ranging and is part of the automatic function. The range cannot be changed manually while the unit is in automatic.

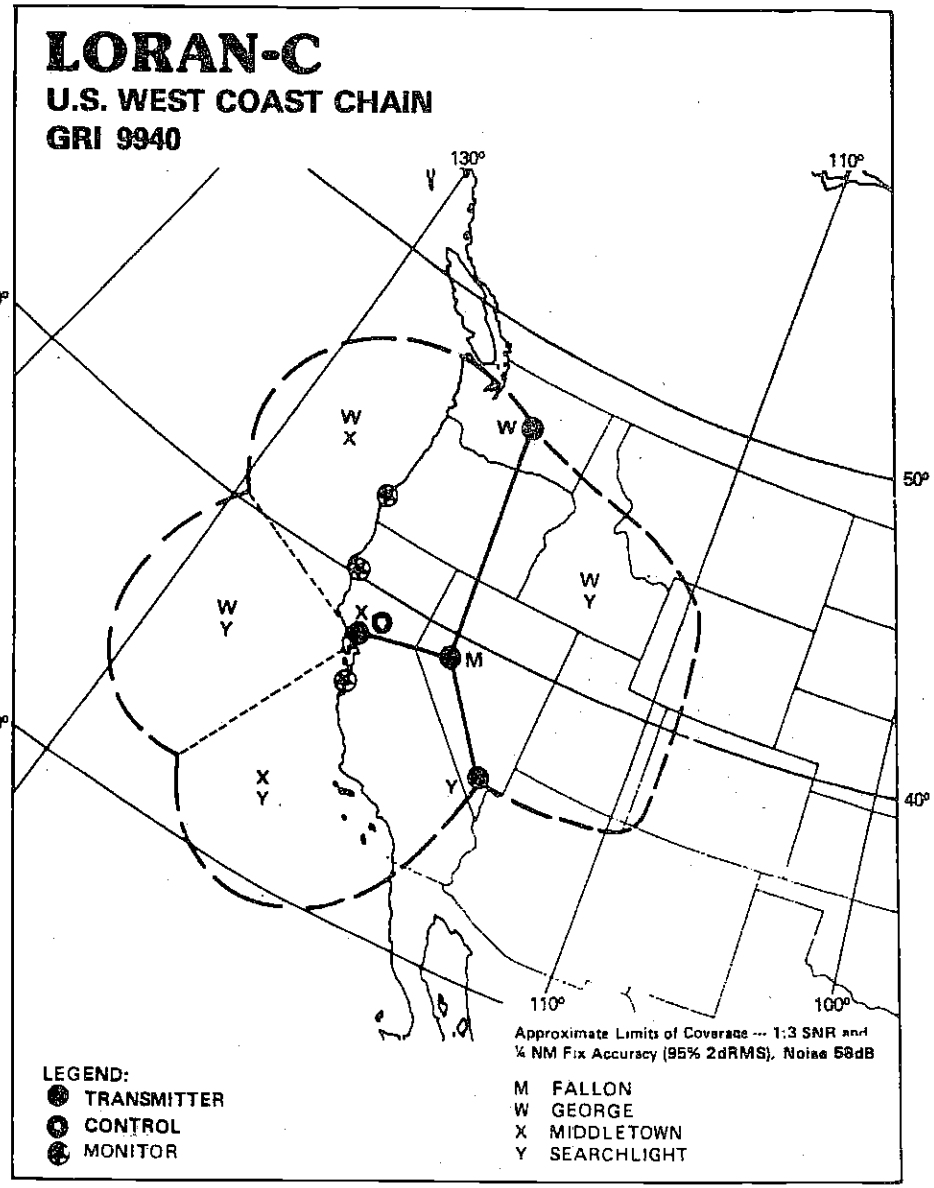
RANGE - Manual

The UltraNav gives you control over the range when it's in the manual mode. Both the lower and the upper limit are adjustable.

To change the range, first make certain the UltraNav is in the manual mode. If necessary, press the AUTO key to switch to the manual mode. Next, press the RANGE key. Two arrows appear in the lower left corner of the display. These are the range adjust arrows. Press the key corresponding to the upper or lower arrow to decrease or increase the range. The available ranges are 0-10, 20, 40, 60, 100, 150, 200, 300, 500, 900 feet. After the desired range is displayed, press the CLEAR key to erase the range arrows.

NOTE: The depth capability of the UltraNav depends on the transducer installation, water and bottom conditions, and other factors. You can expect to read depths in excess of 350 feet in both fresh and salt water.





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U.S. WEST COAST LORAN-C CHAIN GR1 9940
REGIONAL MANAGER COMMANDER. PACIFIC AREA, ALAMEDA, CA
CHAIN MANAGER COMMANDER. PACIFIC AREA, ALAMEDA, CA
COORDINATOR OF CHAIN OPERATIONS LOCATION LORSTA MIDDLETOWN, CA
CONTROL SITE: LORSTA MIDDLETOWN, CA

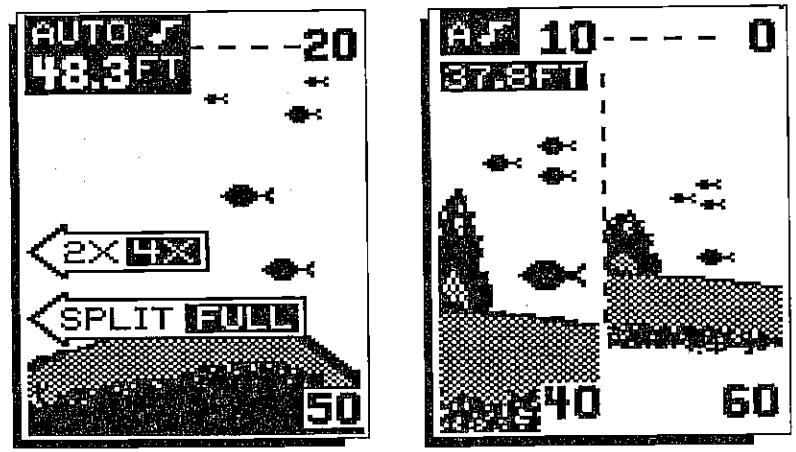
DESIG.	STATION	COOR.	CD/BLL (us)	XMITTER	PWR (KW)	TRANSMIT ANTENNA	NOM ECD	NOTES
MASTER	FALLON, NV	39 33 06.6N 118 49 56.4W		AN/FPN-44A	400	625 FT MONOPOLE	+1.0	
WHISKEY	GEORGE, WA	47 03 48.0N 119 44 39.5W	11000/ 2796.90	AN/FPN-45	1600	SLT	+0.5	DUAL RATE W/GRI9990
XRAY	MIDDLETOWN CA.	38 46 57.0N 122 29 44.5W	27000/ 1094.50	AN/FPN-44A MONOPOLE	400	625 FT	+0.5	
YANKEE	SEARCHLIGHT NV.	35 19 16.2N 114 48 17.4W	40000/ 1967.30	AN/FPN-44	640	SLT	0.0	

ZOOM

Enlarging or "zooming" the picture is a common method used to show small detail and fish signals. The UltraNav gives you two different zoom sizes, plus a split screen zoom option. The zoom operation and adjustment is different in the automatic and manual modes.

ZOOM - AUTOMATIC MODE

To zoom the display in the automatic mode, first press the ZOOM key. All targets on the display are enlarged four times normal size automatically. The menus shown below also appear.



SPLIT SCREEN ZOOM

To switch targets between twice their normal size and four times normal, press the key adjacent to the "2X/4X" label.

To switch between the split screen zoom and full screen zoom, press the key adjacent to the "SPLIT/FULL" label. The screen instantly splits into two sections. All targets on the left are shown at four times the size of the ones on the right. If you switch to the 2X zoom mode, echoes on the left side of the screen are shown at twice the size as the ones on the right. The echoes that scroll across the screen are the exact same echoes on both sides of the screen. They're simply enlarged on the left side. This feature tracks the bottom, keeping it on the display at all times, when the automatic feature is on. Once you've set the zoom as desired, press the CLEAR key to erase the menus.

To turn the Zoom feature off, press the RANGE key.

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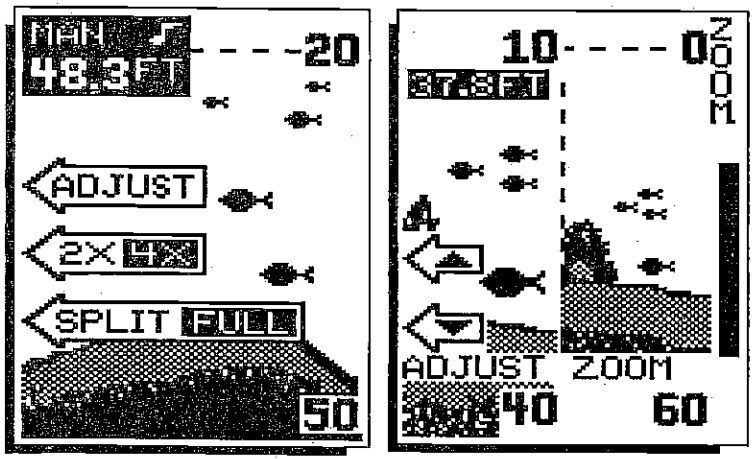
ZOOM - MANUAL MODE

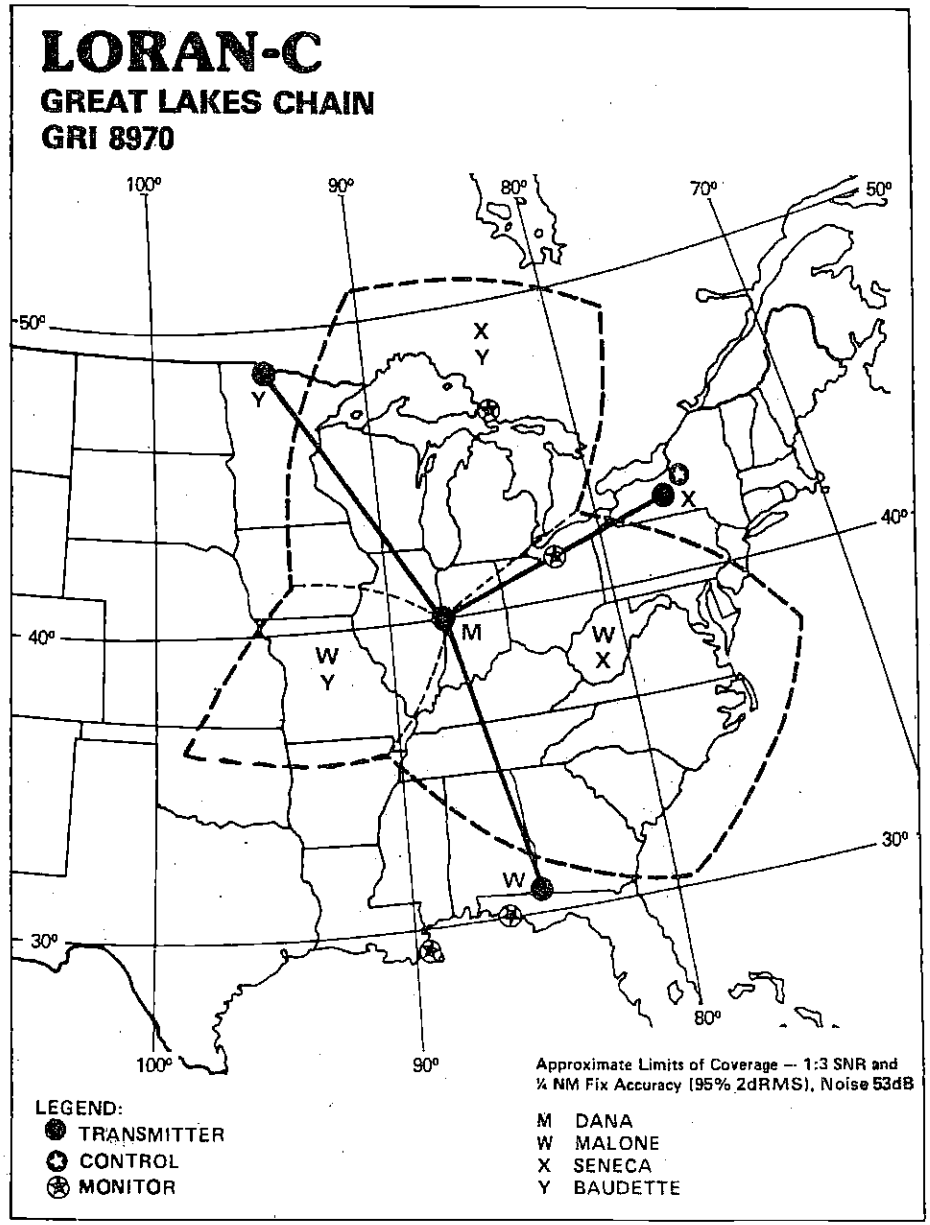
When you press the zoom key while the unit is in the manual mode, the screen shown below appears. The unit is automatically placed in the 4X zoom mode. For a 2X zoom, simply press the key adjacent to the 2X/4X label. For a split screen zoom, press the key adjacent to the SPLIT/FULL label. Remember, the UltraNav won't track the bottom signal while it's in the manual mode.



To adjust the zoom, press the key adjacent to the ADJUST label. A screen similar to the one on the right appears. A zoom bar and adjust arrows appear on the screen. The echoes on the left side of the screen are the ones that appear between the top and the bottom of the zoom bar. Press the keys adjacent to the arrows to move the zoom bar up or down. As you adjust the zoom bar, the echoes move on the left side of the screen at the same time. The zoom adjust menus will automatically clear a few seconds after you've pressed the last key.

ALARMS

The UltraNav has three different types of alarms. The first is the Fish Alarm. It sounds when the Fish I.D. feature determines a group of echoes is a fish. Another alarm is the Zone Alarm which consists of a



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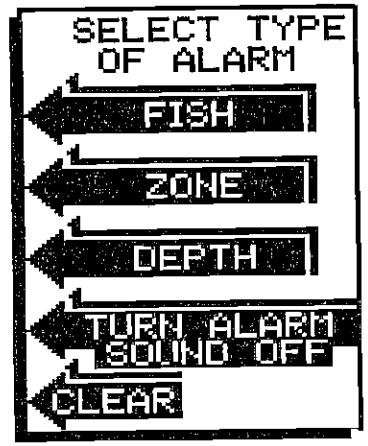
GREAT LAKES LORAN-C CHAIN GR1 8970
REGIONAL MANAGER COMMANDER, ATLANTIC AREA, NEW YORK, NY
CHAIN MANAGER COMMANDER, ATLANTIC AREA, NEW YORK, NY
COORDINATOR OF CHAIN OPERATIONS LOCATION: LORSTA SENECA, NY
CONTROL SITE: LORSTA SENECA, NY

DESIG.	STATION	COOR.	CD/BLL (µs)	XMITTER	PWR (KW)	TRANSMIT ANTENNA	NOM ECD	NOTES
MASTER	DANA, IN	39 51 07.5N 87 29 12.1W		AN/FPN-44	400	625 FT MONOPOLE	0.0	DUAL RATE W/GRI9960
WHISKEY	MALONE, FL	30 59 38.7N 85 10 09.9W	11000/ 3355.11	AN/FPN-64 (56 HCG'S)	800	700 FT MONOPOLE	0.0	DUAL RATE W/GRI7960
XRAY	SENECA, NY	42 42 50.6N 76 49 33.9W	26000/ 8162.06	AN/FPN-64 (56 HCG'S)	800	700 FT MONOPLE	0.0	DUAL RATE W/GRI9960
YANKEE	BAUDETTE	48 36 49.6N	44000/	AN/FPN-42	600	730 FT	0.0	



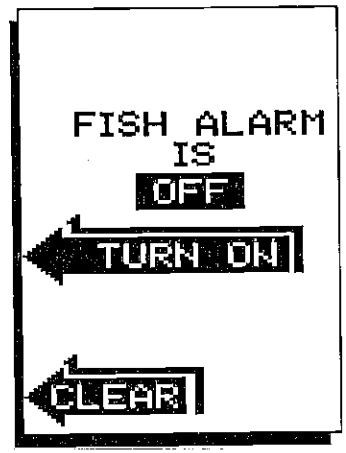
ALARM MENU

bar. Any echo that appears inside this bar triggers the alarm. The last alarm is called the Bottom Alarm. Only the bottom signal will "trip" this alarm. This is useful as an anchor watch, a shallow water alert, or for navigation.

You can also turn the alarm speaker off through the ALARM menu.

FISH ALARM

Use the fish alarm for a distinctive audible alarm when fish or other suspended objects are detected by the Fish I.D. feature. To use the fish alarm feature, first press the ALARM key. Now press the key adjacent to the "FISH" label. The menu shown below appears.



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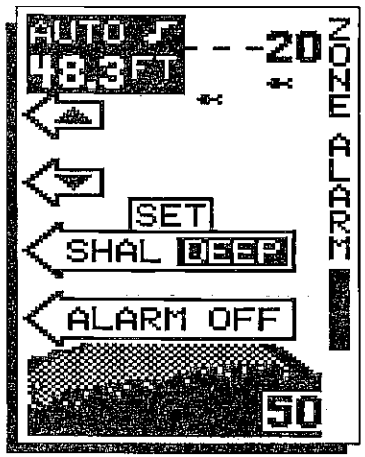
To turn the fish alarm on, press the key adjacent to the "TURN ON" label. The screen will clear and return to the chart display. Each time a fish symbol displays on the screen, a tone will sound. The word "FISH" shows in the lower left corner of the screen. They will flash when the alarm sounds.

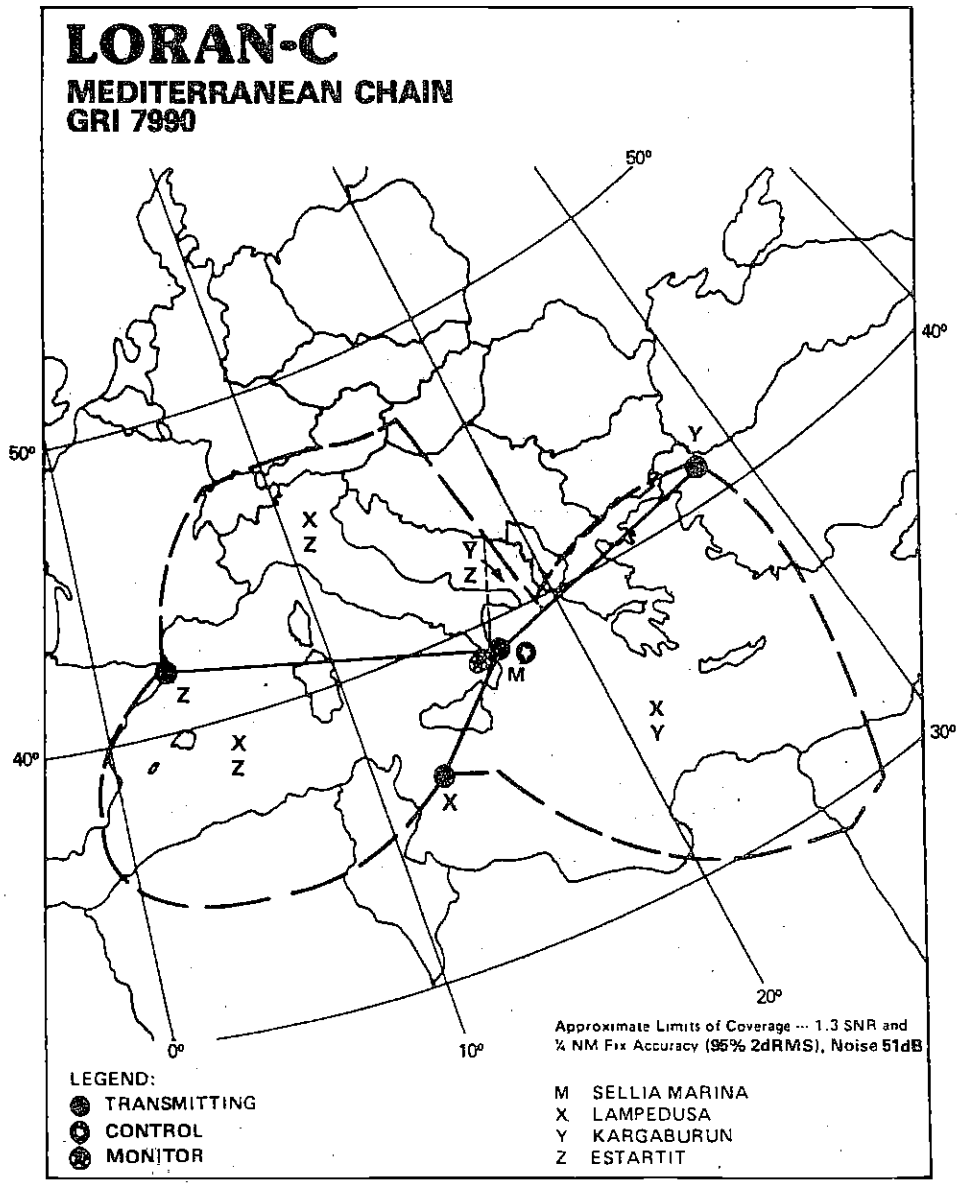
To turn the fish alarm off, again press the ALARM key, then the key adjacent to the "FISH" label. Now press the key adjacent to the "TURN OFF" label. The alarm is now disabled.

ZONE ALARM

To activate the Zone Alarm, first press the ALARM key. Next, press the key next to the Zone Alarm label. The word s "ZONE ALARM" show on the screen's right side, signifying the Zone Alarm is active. The adjustment label appears on the left side of the display, whereas the zone bar shows on the far right side. Any echo that appears between the top and bottom of this bar will trigger the alarm. This alarm will sound on fish, structure, bottom echoes, etc.



To adjust the top of the zone alarm bar, first press the key next to the SET SHAL/DEEP label. The SHAL letters appear in reverse. Now press the key adajacent to the top arrow to move the top of the bar shallower. To adjust the top of the bar deeper, press the key adjacent to the down arrow. To adjust the bottom of the zone alarm bar, again press the key adjacent to the SET SHAL/DEEP label. You can now adjust the bottom of the zone alarm bar using the keys adjacent to the up and down arrows.



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MEDITERRANEAN SEA LORAN-C CHAIN GRI 7990
REGIONAL MANAGER COMMANDER, COAST GUARD ACTIVITIES EUROPE, LONDON, UK
CHAN MANAGER COMMANDER. COAST GUARD ACTIVITIES EUROPE. LONDON. UK
COORDINATOR OF CHAIN OPERATIONS LOCATION: LORSTA SELLIA MARINA, ITALY
CONTROL SITE: LORSTA SELLIA MARINA, ITALY

DESIG.	STATION	COOR.	CD/BLL (us)	XMITTER	PWR (KW)	TRANSMIT ANTENNA	NOM ECD	NOTES
MASTER	SELLIA MARINA,ITALY	38 52 20.6N 16 43 06.2E	-	AN/FPN-39	165	625 FT MONOPOLE	0.0	
XRAY	LAMPEDUSA ITALY	35 31 20.8N 12 31 30.2E	11000/ 1755.96	ATLS	325	625 FT MONOPOLE	0.0	
YANKEE	KARGABURUN TURKEY	40 56 21.0N 27 52 01.5E	29000/ 3273.29	AN/FPN-39	165	625 FT MONOPOLE	0.0	
ZULU	ESTAPTIT SPAIN	42 03 36.5N 03 12 15.5E	47000/ 3999.74	AN/FPN-39	165	625 FT MONOPOLE	0.0	

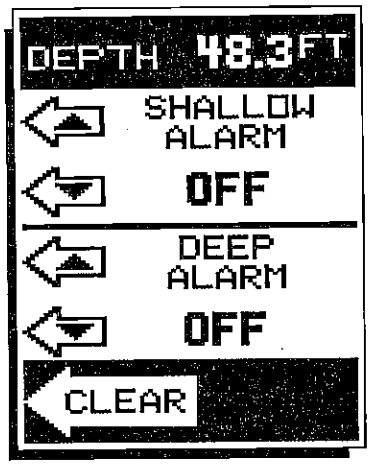
Once you've made the adjustments, press the CLEAR key to erase the menus.

To turn the Zone Alarm off, return to the Zone Alarm menu, then press the key adjacent to the "ALARM OFF" label.

DEPTH ALARM

The Depth Alarm works off the bottom signal only. No other echo will trigger this alarm. The Depth Alarm is actually two different alarms. It consists of a shallow alarm and a deep alarm. The shallow alarm sounds a warning tone when the bottom signal goes shallower than the alarm set point. The deep alarm sounds when the bottom signal goes deeper than the alarm set point. Use the shallow alarm to warn you of shallow water. Use the deep alarm to alert you to deeper water, such as a drop-off.

To turn the Depth Alarm on, press the ALARM key. Next, press the key adjacent to the Depth Alarm label.



This brings you to the Shallow Alarm and Deep Alarm menu. The bottom depth is shown at the top of the display. The shallow and deep alarm adjustment arrows are beneath the digital depth. Now simply press the key adjacent to the up arrow to increase the depth or the

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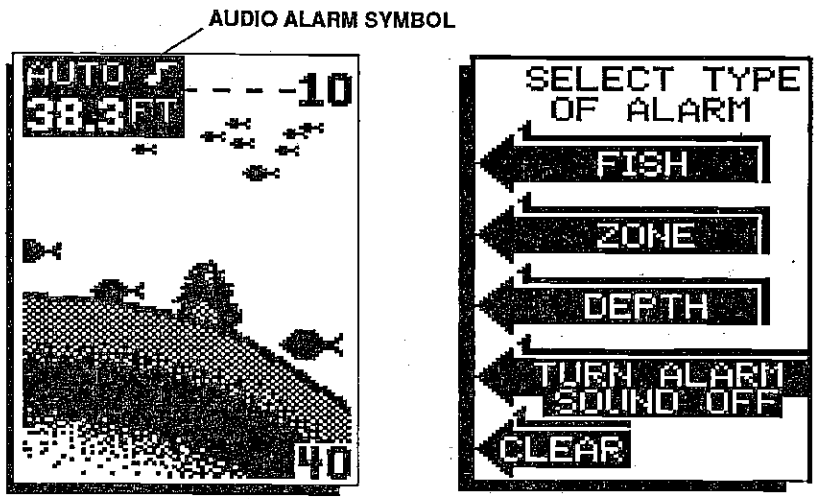
down arrow to decrease it on the desired alarm. The shallow alarm was adjusted in this example, so the key adjacent to the up arrow on the Shallow Alarm was pressed.

The deep alarm adjusts and activates exactly like the shallow alarm. The only difference is the sound the deep alarm makes when the bottom goes deeper than the alarm depth. This tone is different so you can tell by the sound which alarm was triggered.

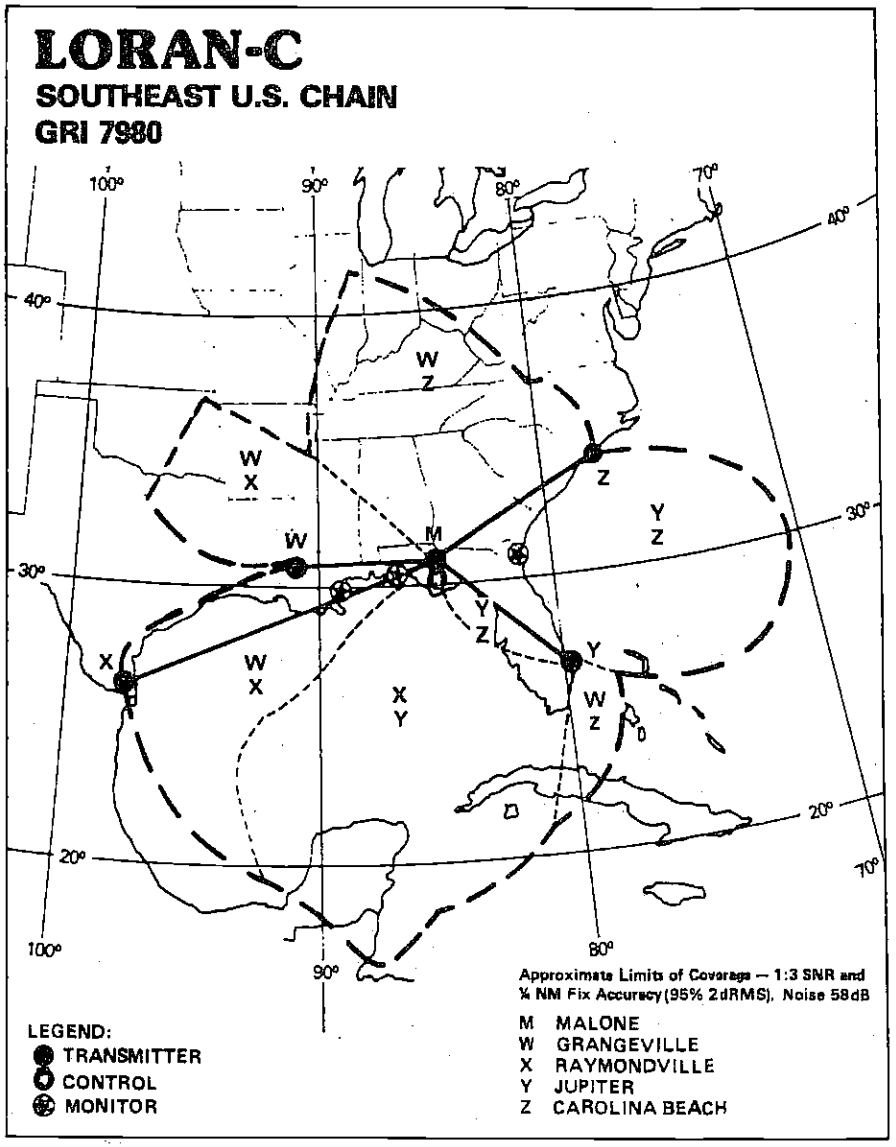
AUDIO ALARM ON/OFF

When the UltraNav is first turned on, the audio alarm is automatically enabled. This is indicated by a note symbol at the top of the screen.



To turn the audio alarm on or off, press the ALARM key. Next, press the key adjacent to the "Turn Alarm Sound Off" label to turn the audio off. To turn the audio alarm on, press the ALARM key again. The label that was used to turn the sound off now reads "Turn Alarm Sound On." Press the key adjacent to this label to turn the sound on.

NOTE: The words corresponding to the alarm in use will still flash on the display when the alarm is triggered even if the speaker is turned off. For example, the word "ZONE" flashes when the zone alarm is triggered.



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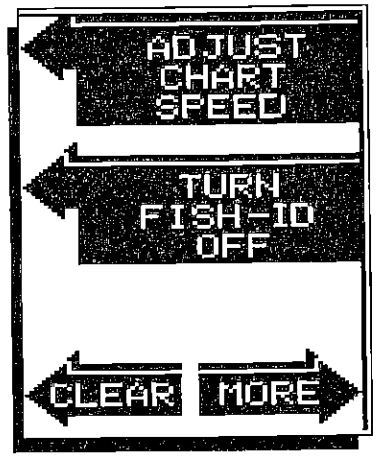
SOUTHEAST U.S. LORAN-C CHAIN FR1 7980
REGIONAL MANAGER COMMANDER. ATLANTIC AREA. NEW YORK, NY
CHAIN MANAGER COMMANDER. ATLANTIC AREA. NEW YORK, NY
COORDINATOR OF CHAIN OPERATIONS LOCATION: LORSTA MALONE, FL
CONTROL SITE: LORSTA MALONE, FL

DESIG.	STATION	COOR.	CD/BLL (us)	XMITTER	PWR (KW)	TRANSMIT ANTENNA	NOM ECD	NOTES
MASTER	MALONE, FL	30 59 38.7N 85 10 09.3W		AN/FPN-64 (56 HCG'S)	800	700 FT MONOPOLE	0.0	DUAL RATE W/GRI 8970
WHISKEY	GRANGEVILLE LA	30 43 33.0N 90 49 43.6W	11000/ 1809.54	AN/FPN-64 (56 HCG'S)	800	700 FT MONOPOLE	+0.5	
XRAY	RAYMOND-VILLE, TX	26 31 55.0N 97 50 00.1W	23000/ 4443.36	AN/FPN-64 (32 HCG'S)	400	700 FT MONOPOLE	0.0	
YANKEE	JUPITER, FL	27 01 58.4N 80 06 53.4W	43000/ 2201.89	AN/FPN-42	325	625 FT MONOPOLE	0.0	
ZULU	CAROLINA BEACH, NC	34 03 46.1N 77 54 46.7W	59000/ 2542.73	AN/FPN-42	550	TIP	0.0	DUAL RATE W/GRI 9960

MENUS

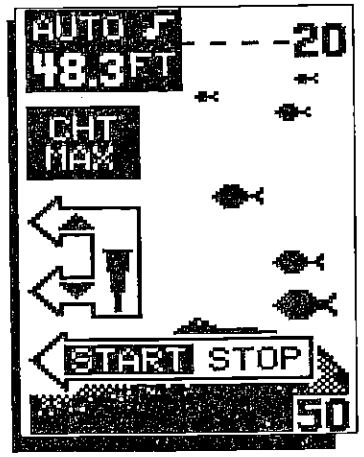
The UltraNav uses menus extensively to guide you through the functions and features of the unit. The menu key accesses many of these features, allowing you to customize the unit to your particular needs and water conditions. Although you may have to leave one menu and enter another to reach the desired function, all you have to do is press the menu key to select the next menu. If you ever get lost in a menu, simply press the key adjacent to the CLEAR label. There are eight sonar menus accessible with the menu key. The menu key shows different menus, depending on which mode the unit is in. For example, if a sonar screen is showing, pressing the menu key will show the first sonar menu screen. If the plotter screen is showing, pressing the menu key displays the first plotter menu screen.



SONAR MENU - PAGE 1

CHART SPEED

The rate echoes scroll across the screen is called the chart speed. It's adjustable by first pressing the menu key, then pressing the key adjacent to the "ADJUST CHART SPEED" label. The chart speed menu appears on the left side of the screen. Increase the chart speed by pressing the key adjacent to the up arrow or decrease it by pressing the key adjacent to the down arrow. The percentage of chart speed in use changes as the arrow keys are pressed. The bar chart also gives a graphical indication of the chart speed. You can see the change on the screen (both on the menu and on the chart record) as you press the keys. After you've made the adjustment, press the key adjacent to the CLEAR key to erase the menu.



To stop the chart, press the key adjacent to the "START STOP" label. Repeat this step to start the chart again.

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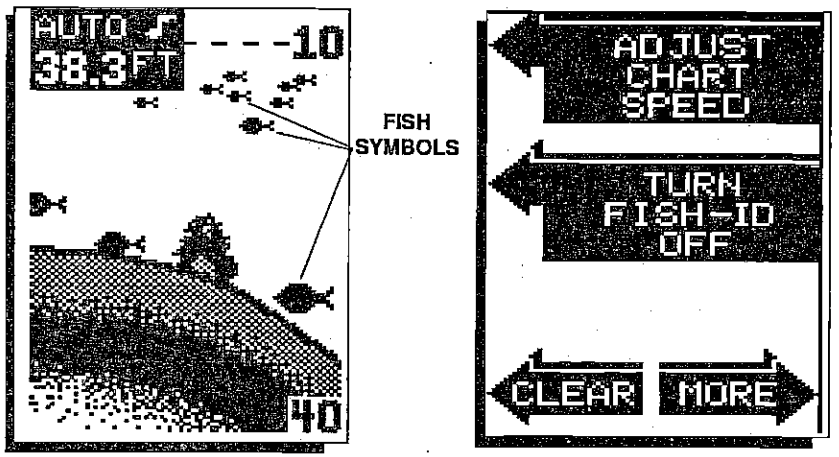
SONAR MENU - PAGE 1

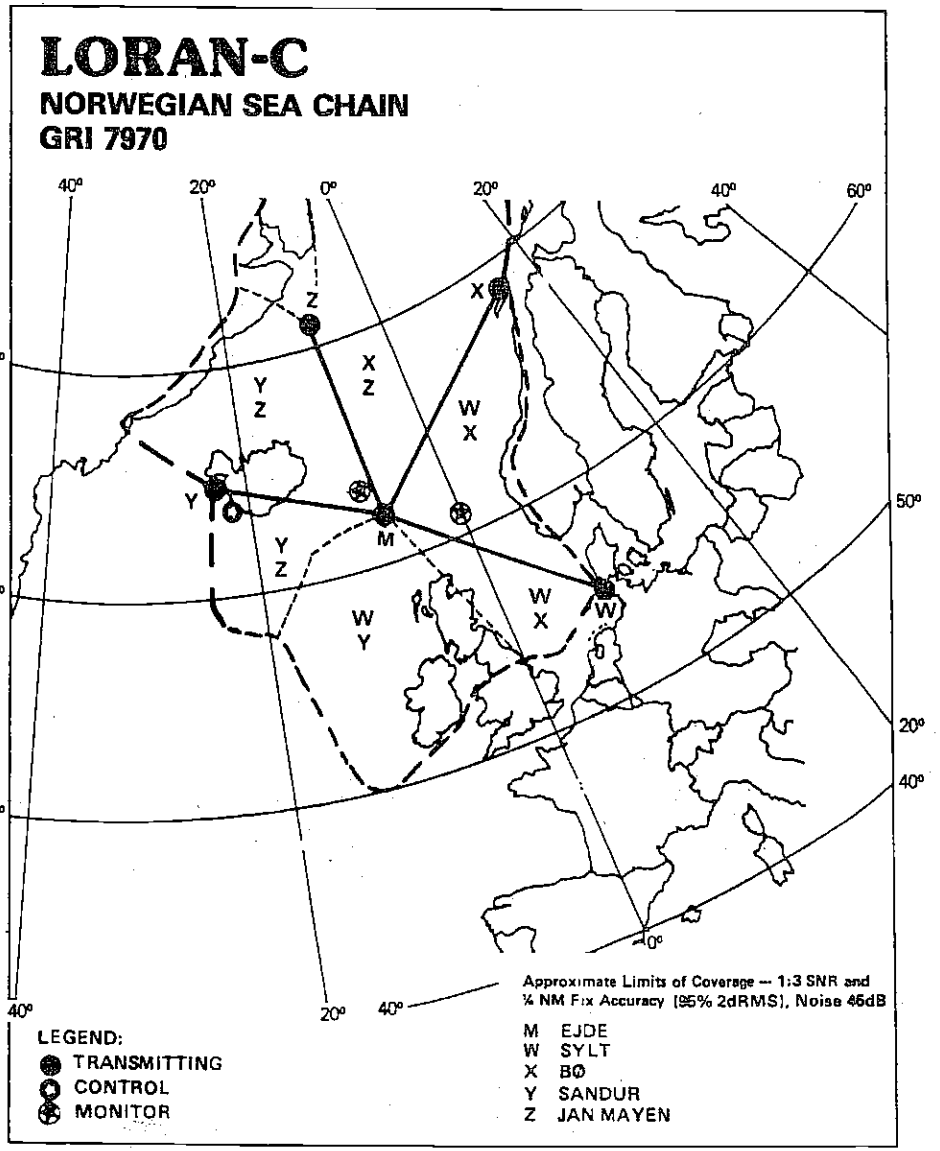
FISH I.D.

The Fish I.D. feature identifies targets that meet certain conditions as fish. The micro-computer analyses all echoes and eliminates surface clutter, thermoclines, and other signals that are undesirable. In most instances, remaining targets are fish. The Fish I.D. feature displays symbols on the screen in place of the actual fish echoes. There are four fish symbol sizes: tiny, small, medium, and large. These are used to designate the relative size between targets. In other words, it displays a small fish symbol when it thinks a target is a small fish, a medium fish symbol on a larger target, etc.

The micro-computer is sophisticated, but it can be fooled. It cannot distinguish between fish and other suspended objects such as trot-lines, turtles, submerged floats, air bubbles, etc. Individual tree limbs extending outwards from a group of limbs is the hardest object for the Fish I.D. feature to distinguish from fish. You may see Fish I.D. symbols on the screen when actually, there are no fish. Practice with the unit in both the Fish I.D. mode and without to become more familiar with the Fish I.D. feature.



When the UltraNav is turned on, the Fish I.D. feature is automatically turned on, also. To turn the Fish I.D. feature off, press the menu key, then press the key adjacent to the "Turn Fish-ID Off" label. Or press the AUTO key. This turns the Fish I.D. feature and automatic off at



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NORWEGIAN SEA LORAN-C CHAIN GRI 7970
REGIONAL MANAGER. COMMANDER, COAST GUARD ACTIVITIES EUROPE, LONDON, UK
CHAIN MANAGER COMMANDER, COAST GUARD ACTIVITIES EUROPE, LOND, UK
COORDINATOR OF CHAIN OPERATIONS LOCATION: LORAN-C DETAIL KEFLAVIK, ICELAND
CONTROL SITE: LORMONSTA DEFIAVIK, ICELAND

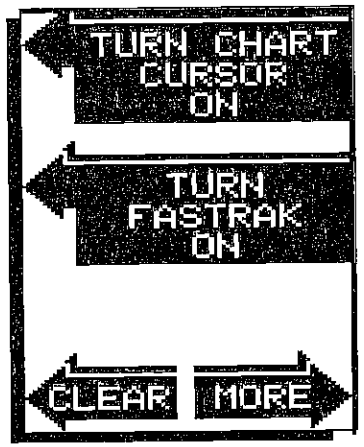
DESIG.	STATION	COOR.	CD/BLL (us)	XMITTER	PWR (KW)	TRANSMIT ANTENNA	NOM ECD	NOTES
MASTER	EJDE,FAEROE IS.,DENMARK	62 17 56.6N 07 04 26.5W		AN/FPN-44	325	625 FT MONOPOLE	0.0	DUAL RATE W/GRI7930
XRAY	BO,NORWAY	68 38 06.2N 14 27 47.0E	11000/ 4048.10	AN/FPN-39	165	625 FT MONOPOLE	0.0	
WHISKEY	SYLT GERMANY	54 46 29.9N 08 17 36.3E	26000/ 4065.62	AN/FPN-42	325	625 FT MONOPOLE	0.0	
YANKEE	SANDUR ICELAND	64 54 26.6N 23 55 21.6W	46000/ 2944.64	AN/FPN-45	1500	1350FT MONOPOLE	0.0	DUAL RATE W/GRI7930
ZULU	JAN MAYEN NORWAY	70 54 52.7W 08 43 58.7W	60000/ 3216.31	AN/FPN-39	165	625 FT MONOPOLE	0.0	

the same time. To turn the Fish I.D. feature on again, first press the menu key. Next, press the key adjacent to the "Turn Fish-I.D. On" label. The menu immediately disappears and the sonar screen returns. Echoes will continue to scroll across the screen, however, the surface clutter will no longer be displayed. Any targets the micro-computer determines are fish will be displayed as fish symbols.

Remember, the Fish I.D. feature cannot be used when the UltraNav is in the manual mode. If you turn the Fish I.D. feature on when the UltraNav is in manual, the micro-computer will turn the automatic feature on. If you turn automatic off when the Fish I.D. feature is on, the Fish I.D. feature will be turned off also.

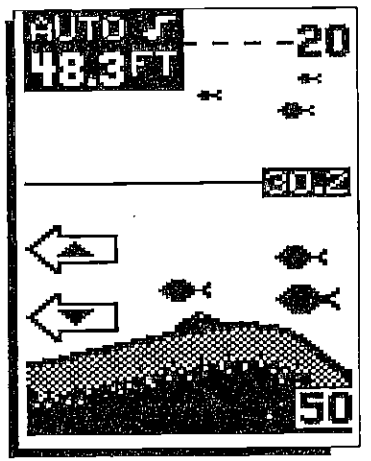
SONAR MENU - PAGE 2

CHART CURSOR



The UltraNav has a chart cursor that allows you to pinpoint a target's depth. The cursor is simply a horizontal line that extends across the display from left to right. A depth box at the end of the line on the right side shows the line's depth. In the example below, the cursor (line) is at 30.2 feet.

To display the chart cursor, press the menu key twice. Now press the key adjacent to the "TURN CHART CURSOR ON" label. A screen similar to the one below appears.



Use the keys adjacent to the up and down arrow to move the cursor up or down to the desired depth.

To turn the chart cursor off, press the menu key twice. Now press the key adjacent to the "TURN CHART CURSOR OFF" label. The UltraNav returns to the sonar screen without the chart cursor.

NOTE: The Chart Cursor will not work when FASTRAK is on, or when the Zone Alarm, or Zoom Window bars are activated.

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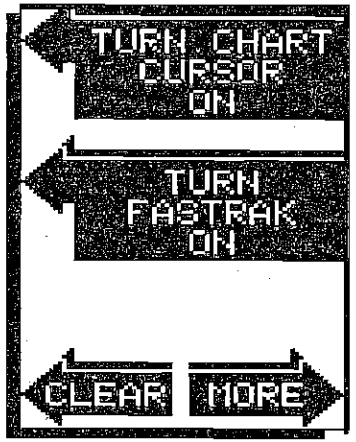
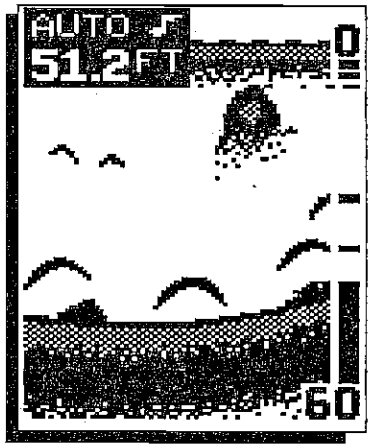
SONAR MENU - PAGE 2

FASTRAK

This feature converts all echoes to short horizontal lines on the display's far right side. The graph continues to operate normally. FASTRAK gives you a rapid update of conditions directly under the boat. This makes it useful for ice fishing, or when you're fishing at anchor. Since the unit is not moving, fish signals are long, drawn out lines on a normal chart display. FASTRAK converts the graph to a vertical bar graph that, with practice, makes a useful addition to fishing at a stationary location.

To turn FASTRAK on, press the menu key twice, then press the key adjacent to the "TURN FASTRAK ON" label. To turn it off, repeat the same steps. The "TURN FASTRAK OFF" label appears instead of the "TURN FASTRAK ON" label.

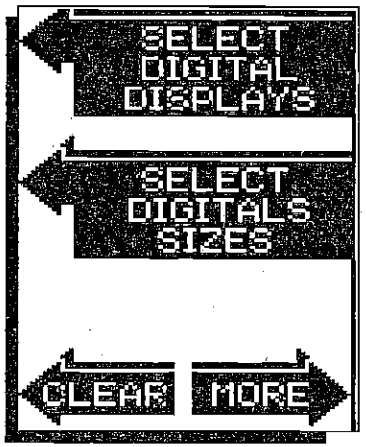


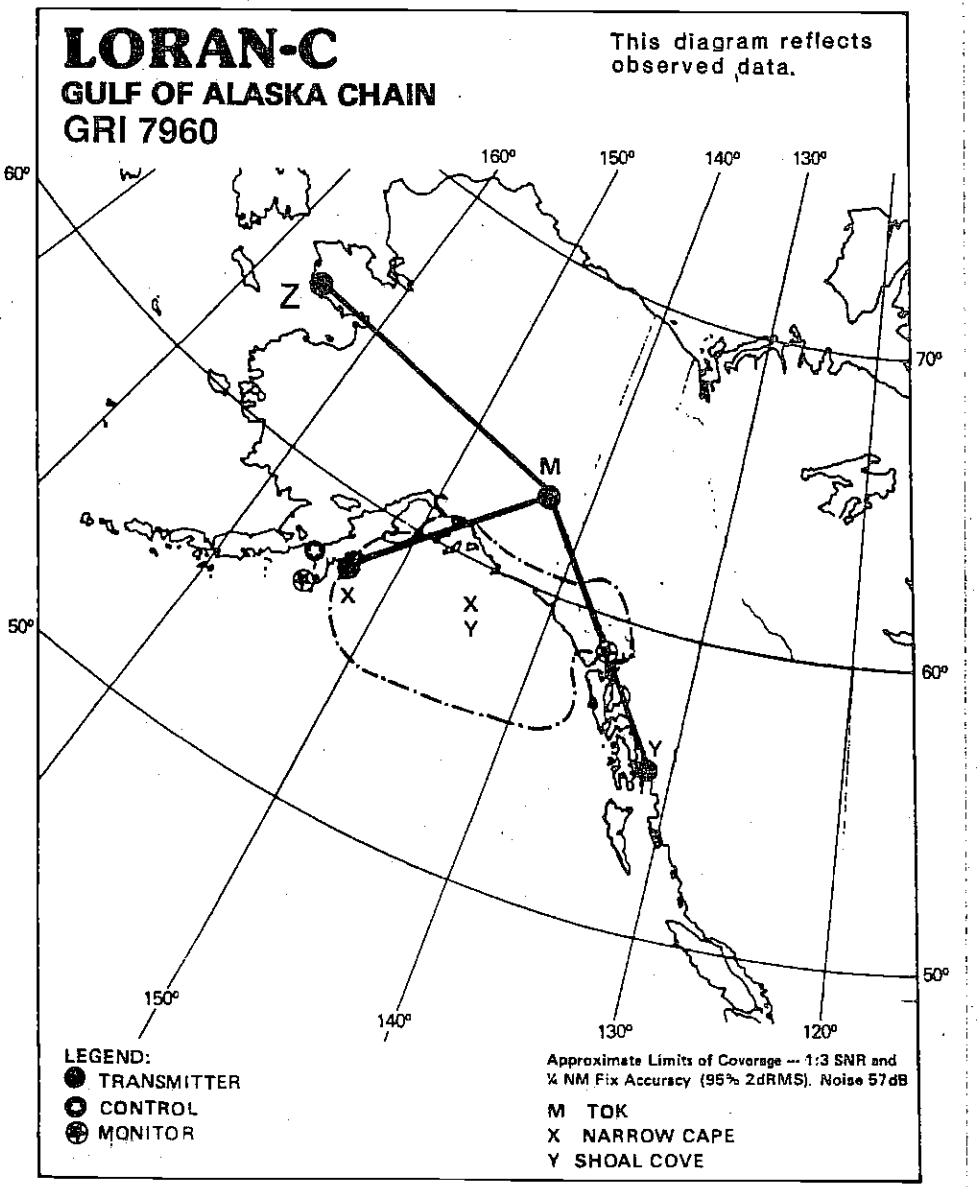


SONAR MENU - PAGE 3

SELECT DIGITAL DISPLAYS

The UltraNav can display the depth, speed, surface water temperature, and distance log on the upper left portion of the screen, if the optional EST-T speed/temp sensor is attached. It can also show your position in latitude/longitude or TD's. When the UltraNav is first turned on, only the depth is displayed. Each digital display can be turned on or off as desired.





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GULF OF ALASKA LORAN-C CHAIN GRI 7960
REGIONAL MANAGER: COMMANDER, PACIFIC AREA, ALAMEDA, CA
CHAIN MANAGER: COMMANDER 17TH COAST GUARD DISTRICT, JUNEAU, AK
COORDINATOR OF CHAIN OPERATIONS LOCATION: LORMONSTA KODIAK, AK
CONTROL SITE: LORNONSTA KODIAK, AK

DESIG.	STATION	COOR.	CD/BLL (us)	XMITTER	PWR (KW)	TRANSMIT ANTENNA	NOM ECD	NOTES
MASTER	TOK AK	63 19 42.8 N 142 48 31.9 W		AN/FPN-44A	540	SLT	+1.0	
XRAY	NARROW CAPE	57 26 20.2 N 152 22 11.3 W	11000/ 2804.45	AN/FPN-44A	400	625 FT MONOPOLE	0.0	DUAL RATE W/ GRI 9990
YANKEE	SHOAL COVE, AK	55 26 20.9 N 131 15 19.6 W	26000 3551.14	AN/FPN-44A	540	SLT	0.0	DUAL RATE W/ GRI 9990
ZULU	PORT CLARENCE	65 14 40.3 N 166 53 12.6 W	44000 3932.52	AN/FPN-44A	400	N/A	N/A	

To select the digital displays menu, first press the menu key three times. Next, press the key adjacent to the "SELECT DIGITAL DISPLAYS" menu at the top of the screen. A screen similar to the one at right appears.

Now press the key adjacent to the desired display. For example, to turn the temperature display on, press the key adjacent to the "TEMP. IS OFF" label.
Once you do this, the display will show the temperature and read "TEMP. IS ON". You can turn each display on or off individually.

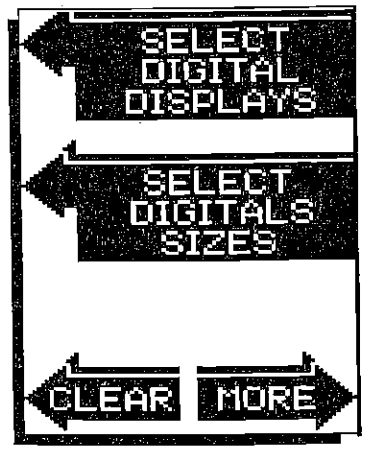
Press the CLEAR key to exit from this menu or wait approximately ten seconds and the menus will automatically clear.

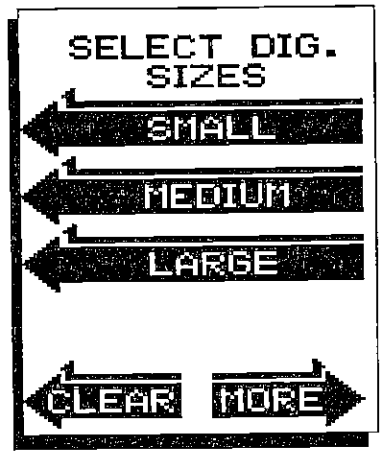
NOTE: The "LORAN IS OFF" means the loran position display on the sonar screen is off. This screen does not turn the loran on or off.

SONAR MENU - PAGE 3

SELECT DIGITAL SIZES

The digital displays can be shown in three different sizes - small, medium, or large. To change the size of the digital display, first press the menu key three times. Now press the key adjacent to the "SELECT DIGITAL SIZES" menu. The screen shown below appears.





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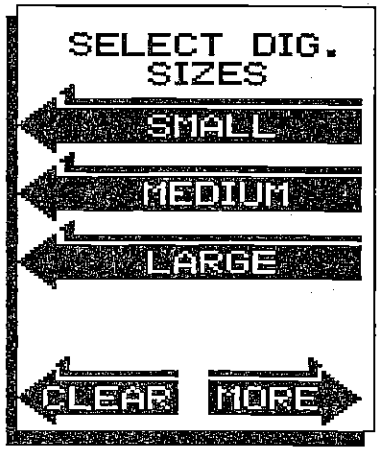
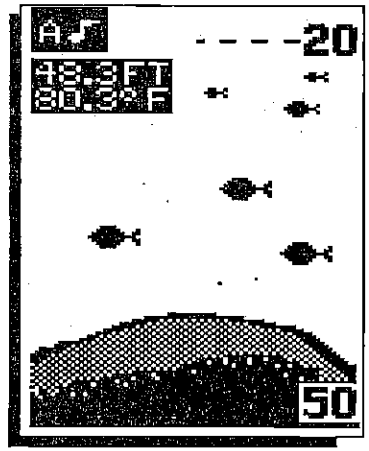
Now simply press the key adjacent to the desired label. For example, if you press the key adjacent to the "SMALL" label, the digital displays are shown in small numbers.

The large digital selection erases the chart and shows the digital displays in large. Pressing the menu key gives only one menu page which is different from other menus. This menu lets you go back to chart information, placing the digital display back in the medium size, select digital displays, and adjust the depth alarm. Returning to the chart restores the normal menu operation.





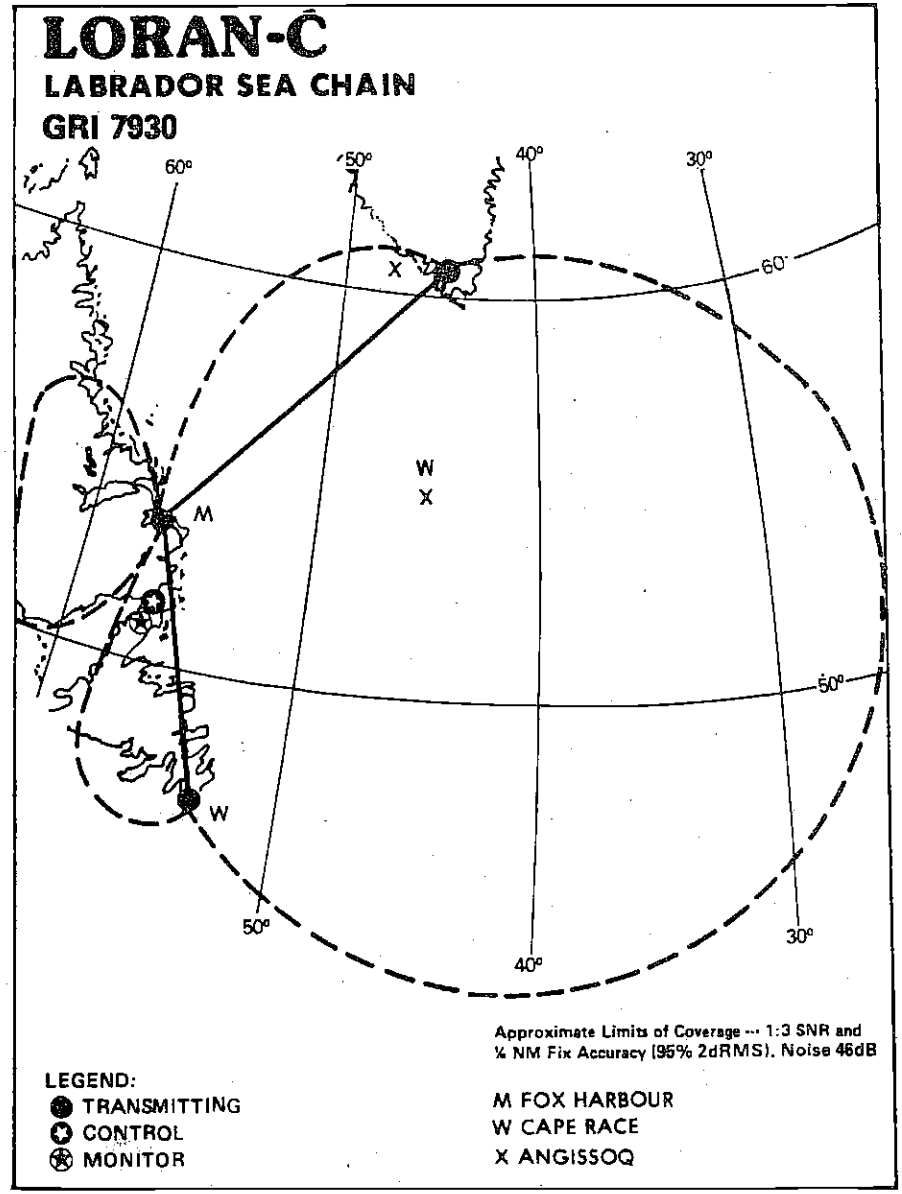
SMALL DIGITAL DISPLAY

SONAR MENU - PAGE 4

SELECT UNITS OF MEASURE

The UltraNav can display the water depth in feet or meters, surface water temperature in degrees Fahrenheit or Celsius, speed in statute miles per hour or knots, and distance (log) in miles or nautical miles. This menu switches all displays to their metric equivalent and back again. You cannot switch each display individually.

To change the units of measure, first press the menu key four times. The screen above left appears. Next, press the key adjacent to the "SELECT UNITS OF MEASURE" label. The screen at the above right appears. Now press the key adjacent to the "CHANGE TO METERS, °C, NAUTICAL MILES" label. The unit of measure will change to the metric equivalent. Repeat the same steps to switch the units of measure again.



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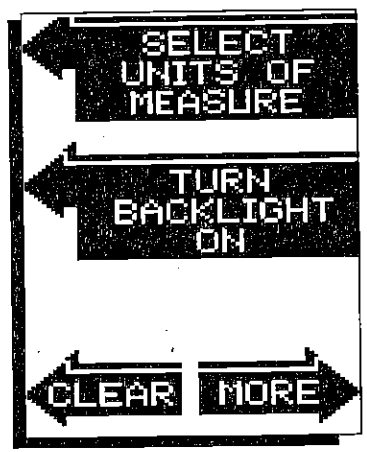
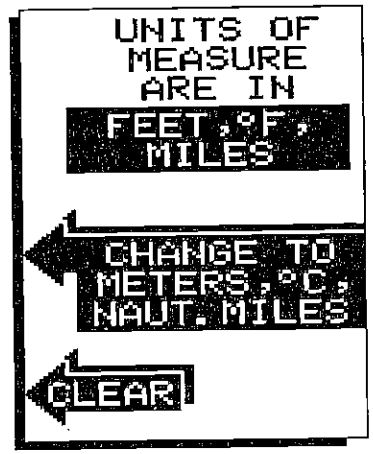
LABRADOR SEA LORAN-C CHAIN GRI 7930
REGIONAL MANAGER COMMANDER ATLANTIC AREA NEW YORK, NY
CHAIN MANAGER COMMANDER, ATLANTIC AREA, NEW YORK, NY
COORDINATOR OF CHAIN OPERATIONS LOCATION: LORMONSTA ST. ANTHONY, NEWFOUNDLAND, CANADA
CONTROL SITE: LORMONSTA ST. ANTHONY, NEWFOUNDLAND

DESIG.	STATION	COOR.	CD/BLL (us)	XMITTER	PWR (KW)	TRANSMIT ANTENNA	NOM ECD	NOTES
MASTER	FOX HARBOUR NFLD, CANANDA	52 22 35.2N 55 42 28.4W		AN/FPN-64 (56 HCG'S)	800	700 FT MONOPOLE	0.0	DUAL RATE W/GRI 5930
WHISKEY	CAPE RACE NFLD, CANADA	46 46 32.2N 53 10 26.2W	11000/ 2167.31	AN/FPN-45	1500	1350 FT MONOPOLE	0.0	DUAL RATE W/GRI 5930
XRAY	ANGISSOO GREENLAND	59 59 17.3N 45 10 27.5W	26000/ 3585.39	AN/FPN-45	760	625 FT MONOPOLE	0.0	DUAL RATE W/GRI 9960





SONAR MENU - PAGE 4

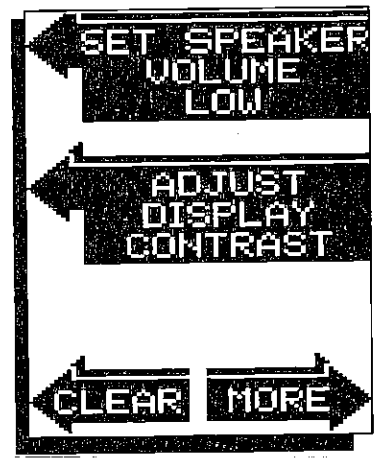
BACKLIGHTS

The UltraNav has internal lights for the display and keyboard. To turn these on, press the menu key four times, then press the key adjacent to the "TURN BACKLIGHT ON" label. To turn the backlights off, repeat the same steps.

SONAR MENU - PAGE 5

SPEAKER VOLUME

The speaker volume has two steps - low and high. The speaker volume is high when the unit is first turned on. To change it, first press the menu key five times. Now press the key adjacent to the "SET SPEAKER VOLUME LOW" label. To switch back to the high volume, repeat the above steps.



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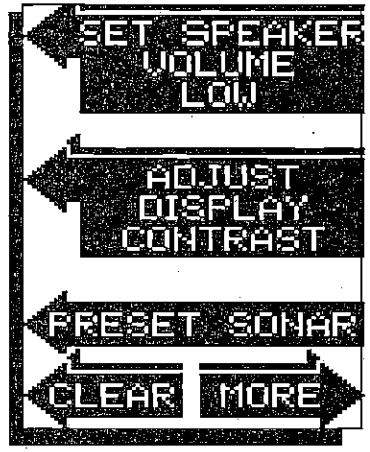
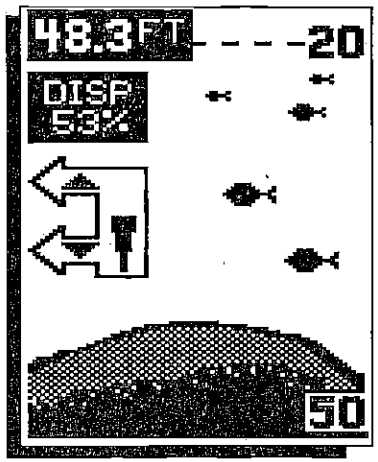
SONAR MENU - PAGE 5

DISPLAY CONTRAST

The unit's display contrast is adjustable to suit different lighting conditions. To adjust it, first press the menu key five times. The menu shown above appears. Now press the key adjacent to the "ADJUST DISPLAY CONTRAST". The display contrast arrows appear on the left side of the screen. To increase the contrast, press the key adjacent to the up arrow. To decrease it, press the key next to the down arrow. Press the Clear key to erase the menu, or wait approximately ten seconds and they'll automatically clear.

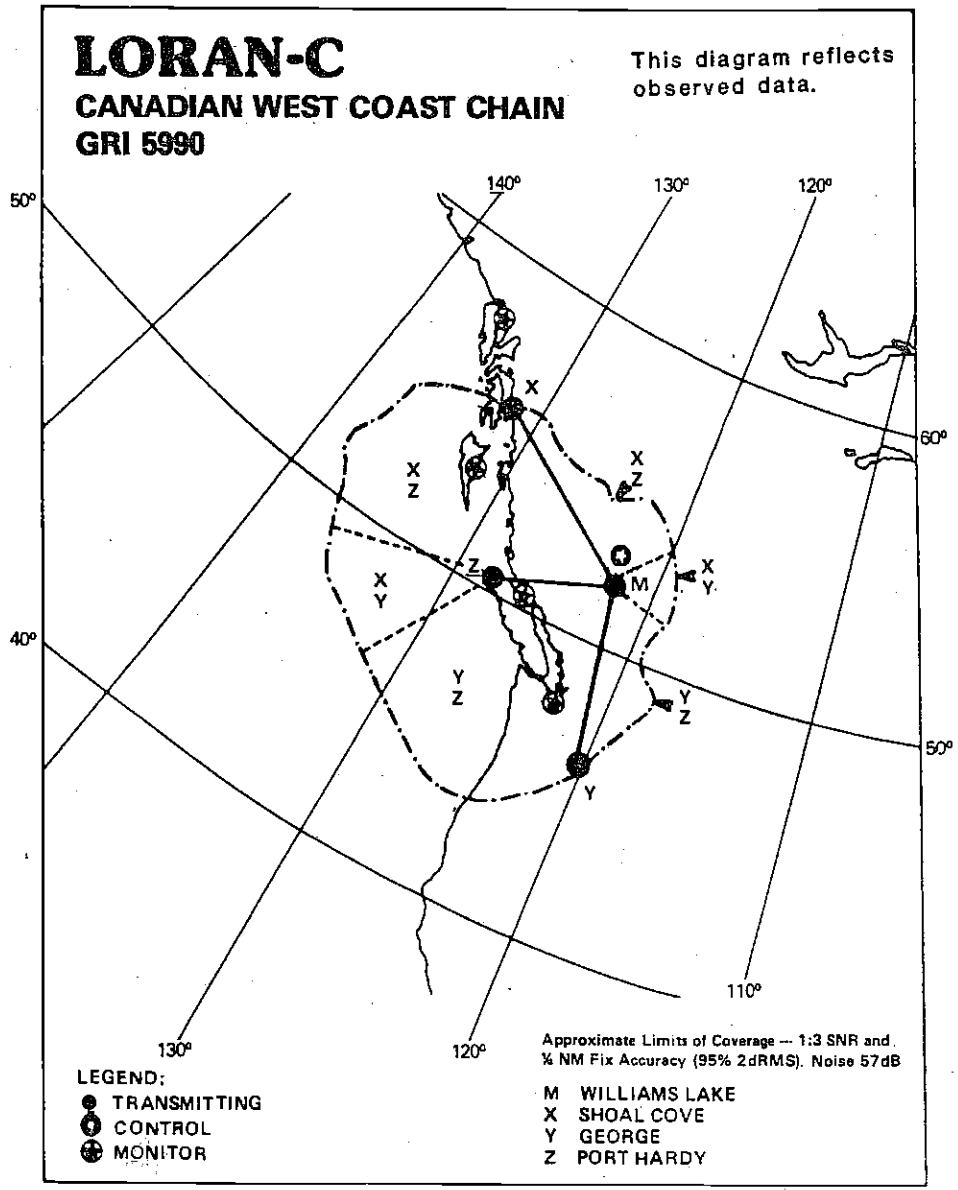




PRESET - MEMORY

The UltraNav saves all settings such as sensitivity, chart speed, display contrast, and more in battery backed-up memory. This memory is retained even if power is disconnected from the unit. If you need to return the sonar settings to the factory defaults, first press the MENU key while a sonar screen is displayed five times. The screen at the top of this page appears. Now press the key adjacent to the "PRESET SONAR" label. The unit will reset, return to a sonar screen with all of the original factory settings.

NOTE: Preset does not affect the loran operation, nor does it erase any loran settings, waypoints, or routes.



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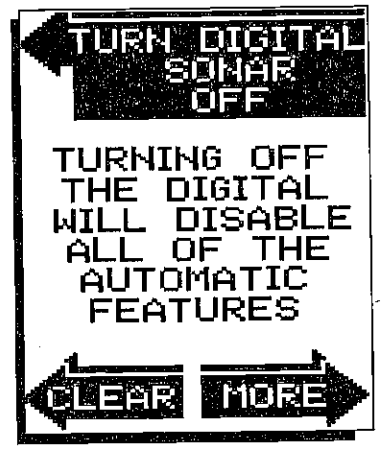
CANADIAN WEST COAST LORAN-C CHAIN GR1 5990
REGIONAL MANAGER COMMANDER. PACIFIC AREA, ALAMEDA, CA
CHAIN MANAGER COMMANDER. PACIFIC AREA, ALAMEDA, CA
COORDINATOR OF CHAIN OPERATIONS LOCATION: LORSTA MIDDLETOWN, CA
CONTROL SITE: LORSTA WILLIAMS LAKE, BC. CANADA

DESIG.	STATION	COOR.	CD/SLL (us)	XMITTER	PWR (KW)	TRANSMIT ANTENNA	NOM ECD	NOTES
MASTER	WILLIAMS LAKE, BC. CANADA	51 57 58.8N 122 22 02.2W	.	AN/FPN-44A	400	625 FT MONOPOLE	+ 1.0	
XRAY	SHOAL COVE AK	55 26 29.9N 131 15 19.7W	11000/ 2343.60	AN/FPN-44A	540	SLT	0.0	DUAL RATE W/GRI 7960
YANKEE	GEORGE, WA	47 03 48.0N 119 44 39.5W	27000/ 1927.36	AN/FPN-45	1600	SLT	+0.5	DUAL RATE W/GRI 9940
ZULU	PORT HARDY BC, CANADA	50 36 29.7N 127 21 29.0W	41000/ 1266.61	AN/FPN-64 (32 HCG'S)	400	625 FT MONOPOLE	0.0	ALERT BAY

SONAR MENU - PAGE 6



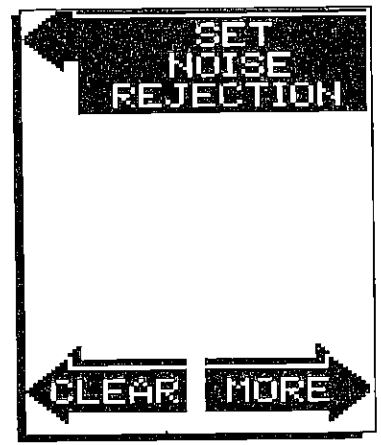
DIGITAL SONAR

When the UltraNav is turned on for the first time, the digital depth display is located at the top left corner of the screen. This display comes from a separate digital sonar built into the Ultra. It displays only the bottom depth. If it loses the bottom, the last known depth will flash on the display. When the digital finds the bottom, it will automatically display the bottom depth again.

The digital sonar can be turned off, however this also turns all automatic features off also, such as auto sensitivity, auto ranging, and the Fish I.D. feature.

To tum the digital sonar off, press the Menu key six times. Now press the key adjacent to the "TURN DIGITAL SONAR OFF" label. To turn it back on again, repeat the same steps.

SONAR MENU - PAGE 7
FISH I.D. ON



NOISE REJECTION

The UltraNav's noise rejection feature is an effective tool in combating noise. In sonar terms, noise is any undesired signal. It is caused by electrical and mechanical sources such as bilge pumps, engine ignition systems and wiring, air bubbles passing over the face of the transducer, even vibration from the engine. In all cases, noise can produce unwanted marks on the display.

The UltraNav has a two step noise rejection system. When the unit is turned on, the noise rejection is on normal. If you have noise problems (identified by random lines or dots on the display), try changing the noise rejection level to high.

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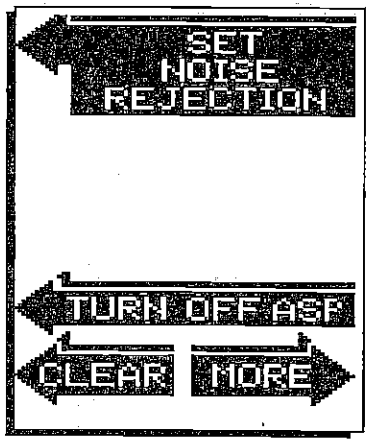
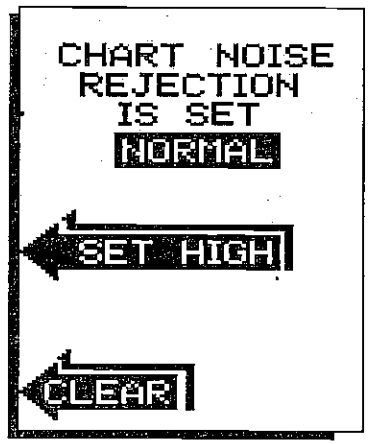
To do this, first press the menu key seven times. Now press the key adjacent to the "SET NOISE REJECTION" label.

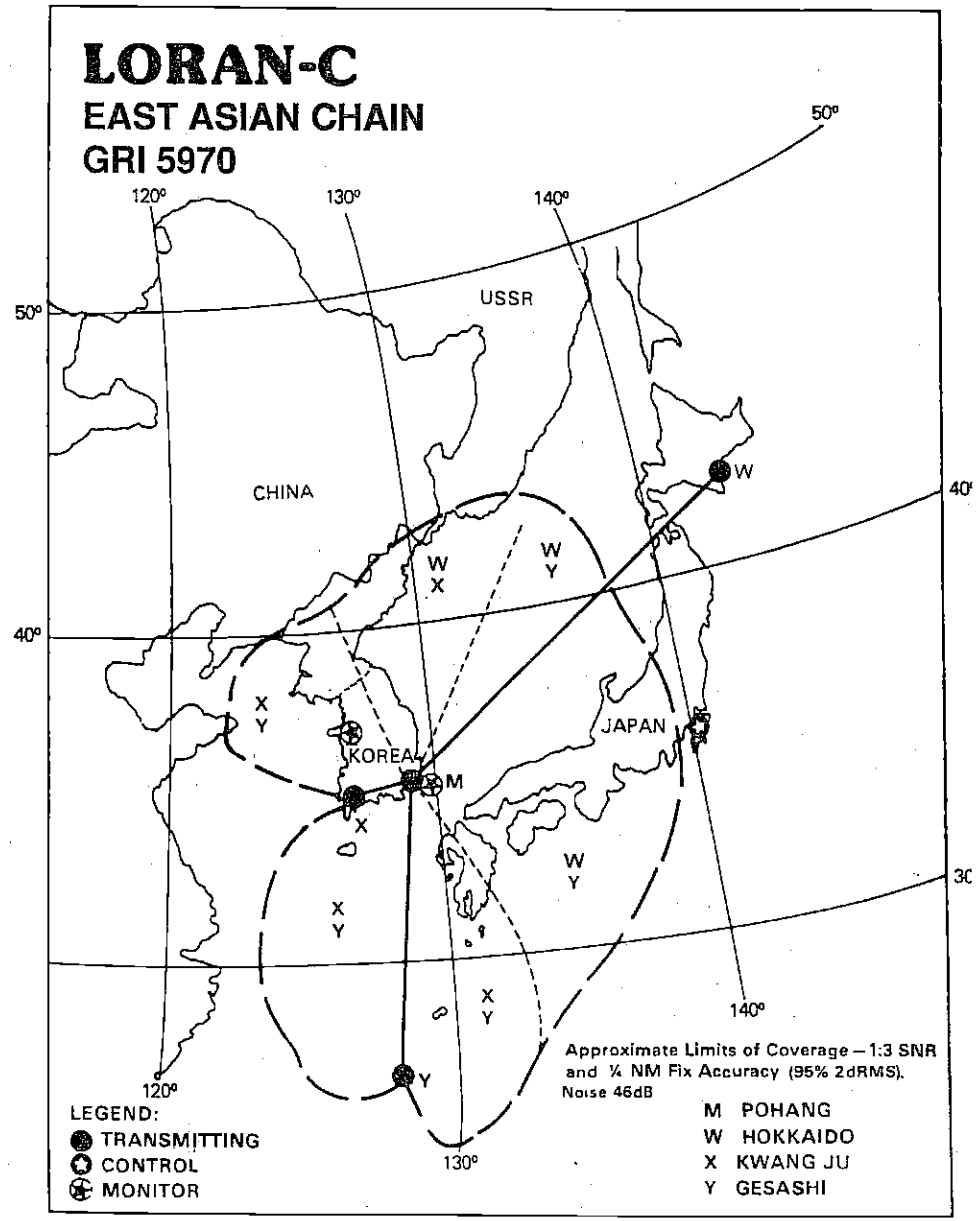
The screen at the lower right appears. Now press the key adjacent to the "SET HIGH" label. The screen will clear and return to the chart screen. The noise should be cleared from the display as new echoes scroll across the screen. If it isn't, you may have a problem with electrical wiring, engine, or transducer installation. Check with your local dealer, Eagle service center, or the Eagle factory customer service department for help.





SONAR MENU -PAGE 7 - ASP
(Advanced Signal Processing)

ASP is a program embedded in the UltraNav's computer that continually monitors the signals from the receiver. It determines which echoes are noise, rejects them, allowing target echoes to be displayed with a minimum of screen clutter. This feature is especially useful, since it typically allows you to operate the boat at all speeds without adjusting the sensitivity. When the UltraNav is first turned on, ASP is enabled. To turn ASP off, press the menu key seven times. The menu shown above on the left appears. Now press the key adjacent to the "Turn Off ASP" label. The unit will return to the sonar screen with ASP off. To turn ASP on again, repeat the above steps.



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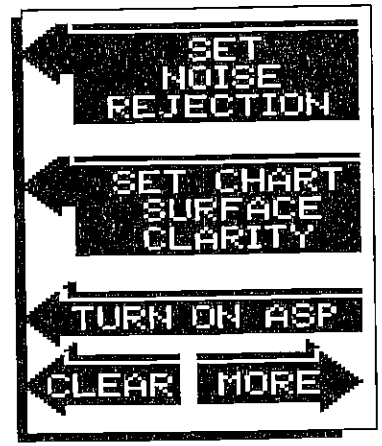
EAST ASIAN LORAN-C GRI 5970
REGIONAL MANAGER: PACIFIC AREA, ALAMEDA, CA
CHAIN MANAGER: COMMANDER, 14TH COAST GUARD DISTRICT, HONOLULU, HI
COORDINATOR OF CHAIN OPERATIONS LOCATION: COMMANDER, FAR EAST SECTION, YOKATA, JAPAN
CONTROL SITE: LORMONSTA YOKOTA, JAPAN

DESIG.	STATION	COOR.	CD/BLL (us)	XMITTER	PWR (KW)	TRANSMIT ANTENNA	NOM ECD	NOTES
MASTER	POHANG KOREA	36 11 05.8N 129 20 27.3E		AN/TRN-38	35	400 FT MONOPOLE	-1.5	USAF MANNED
WHISKEY	HOKKAIDO JAPAN	42 44 37.1N 143 43 09.2E	11000/ 4783.68	AN/FPH-45	1000	625 FT MONOPOLE	+0.5	DUAL RATE W/GRI 9970
XRAY	KWANG JU KOREA	35 02 23.9N 126 32 26.7E	31000/ 947.02	AN/TRN-38	35	400 FT MONOPOLE	-1.75	USAF MANNED
YANKEE	GESASHI JAPAN	26 36 25.0N 126 09 56.4E	42000/ 3555.56	AN/FPN-45	1000	625 FT MONOPOLE	0.0	DUAL RATE W/GRI 9970

SONAR MENU - PAGE 7 - FISH I.D. OFF

SURFACE CLARITY CONTROL - SCC

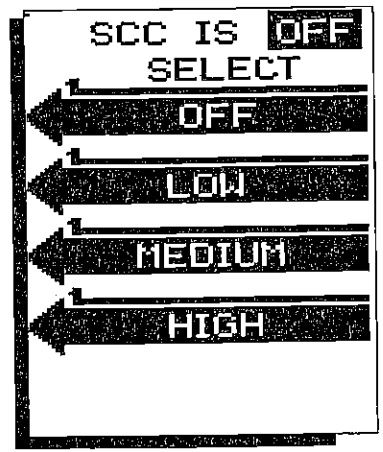
The markings extending downwards from the zero line can extend many feet below the surface. These markings are called surface clutter and are caused by wave action, boat wakes, temperature inversion, and more.



Surface Clarity Control, or SCC reduces or eliminates undesired signals from the display. SCC varies the sensitivity of the receiver, decreasing it near the surface and gradually increasing it as the range increases. Typically, the maximum depth that SCC affects is 75% of the range. For example, on a 0-60 foot range with maximum SCC, surface clutter would be reduced to approximately 45 feet.

There are three levels of SCC available when the Fish I.D. feature is off: low, medium, and high. When the Fish I.D. feature is on, the SCC is not adjustable and this menu doesn't shown on the display.

To adjust the SCC, make certain the Fish I.D. feature is off, then press the MENU key seven times. Now press the key adjacent to the "SET CHART SURFACE CLARITY" label. Finally, press the key adjacent to the desired SCC level. The unit will return to the chart, using the level of SCC you chose.



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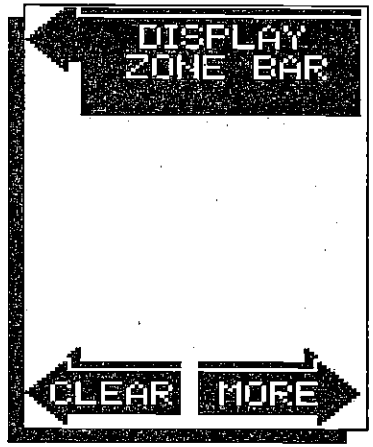
MENU - PAGE 8

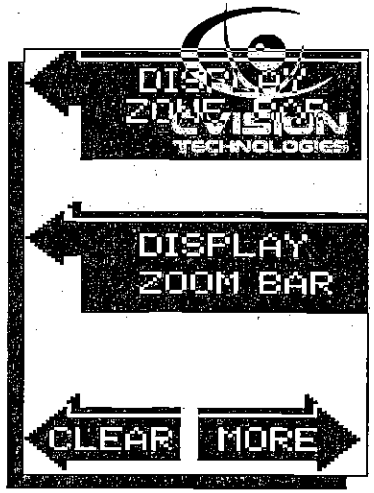
DISPLAY ZONE BAR

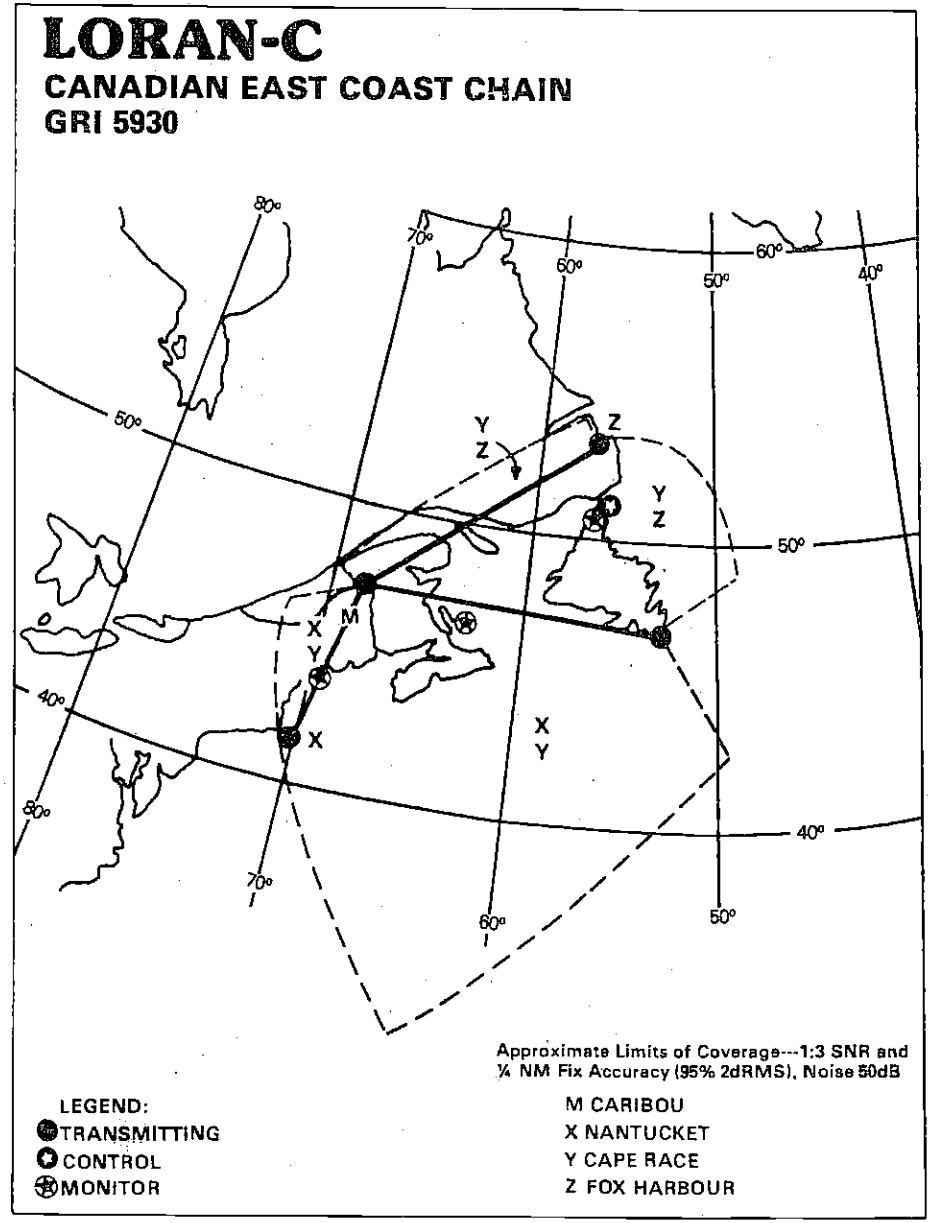
The bar used in the zone alarm normally disappears after the alarm is set. It can be turned on continuously, if desired. To turn the zone alarm bar on, press the menu key eight times. Now press the key adjacent to the "DISPLAY ZONE BAR" label. The menu screen disappears and the zone alarm bar displays on the right side of the screen. This will also turn the zone alarm on if it wasn't already on. Repeat these steps to turn the zone alarm bar off. Turning it off also turns the zone alarm off.



MENU - PAGE 8
DISPLAY ZOOM BAR

When the UltraNav is in the manual mode, the Zoom Bar can be turned on continuously. To do so, first make certain the Ultra is in the manual mode, then press the MENU key eight times. Now press the key adjacent to the "Display Zoom Bar" label. Note: The zoom bar only shows in the Split Zoom mode.





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CANADIAN EAST COAST LORAN-C CHAIN GR1 5930
REGIONAL MANAGER COMMANDER ATLANTIC AREA. NEW YORK, NY
CHAIN MANAGER COMMANDER ATLANTIC AREA, NEW YORK, NY
COORDINATOR OF CHAIN OPERATIONS LOCATION LORMONSTA ST ANTHONY, NEWFOUNDLAND, CANADA
CONTROL SITE: LORMONSTA ST. ANTHONY, NEWFOUNDLAND, CANADA

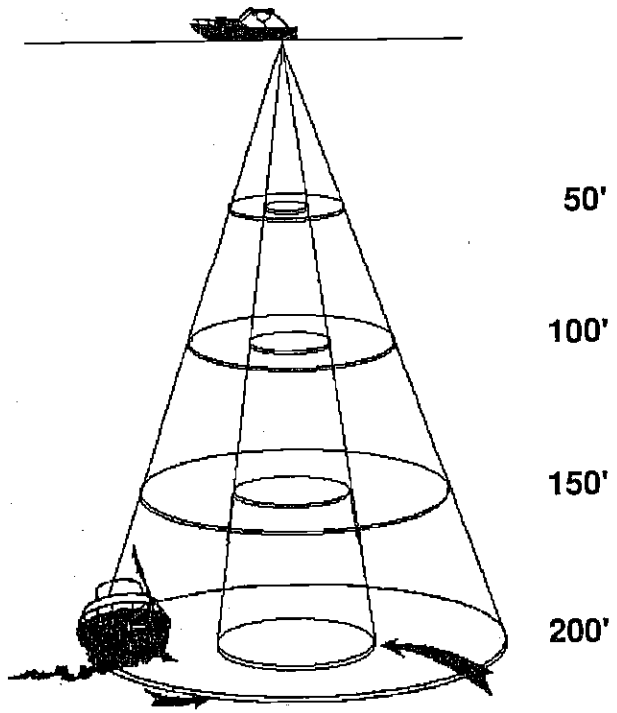
DESIG.	STATION	COOR.	CD/BLL (us)	XMITTER	PWR (KW)	TRANSMIT ANTENNA	NOM ECD	NOTES
MASTER	CARIBOU ME	46 48 27.2N 67 55 37.7W		AN/FPN-42	350	SLT	0.0	DUAL RATE W/GRI9960
XRAY	NANTUCKET MA	41 15 11.9N 69 59 39.1W	11000/ 2131.86	AN/FPN-42	325	625 FT MONOPOLE	0.0	DUAL RATE W/GRI9960
YANKEE	CAPE RACE NFLD CANADA	46 46 32.2N 53 10 28.2W	25000/ 3755.02	AN/FPN-45	1500	1350 FT MONOPOLE	0.0	DUAL RATE W/GRI7930
ZULU	FOX HARBOUR NFLD CANADA	52 22 35.2N 55 42 26.4W	3000/ 3594.59	AN/FPN-64 (56 HCG'S)	800	700 FT MONOPOLE	0.0	DUAL RATE W/GRI7930

TRANSDUCER CONE ANGLES

The sound waves from the transducer spread out into the water in a cone shaped beam. This looks much like the beam from a flashlight. The angle between the outside edges of the cone is the cone angle.

Eagle offers a choice of transducers with either an 8 or 20 degree cone angle. The transducer supplied with the Ultra has a 20 degree cone angle. Typically, wide cone angle transducers (20 degrees) are ideal for operating in shallow to medium water depths. The 20 degree cone angle allows you to see more of the underwater world. In 15 feet of water the 20 degree cone covers an area about six feet across. The 8 degree transducer covers only about a two foot circle.

The 20 degree transducer is almost always the best to use in fresh water, the 8 degree mostly in salt water. In a deep water environment, (300 feet - fresh water, 100 feet - salt water) the narrow cone angle is more desirable. Since the sound energy is concentrated in a smaller area, it can penetrate to much deeper depths.



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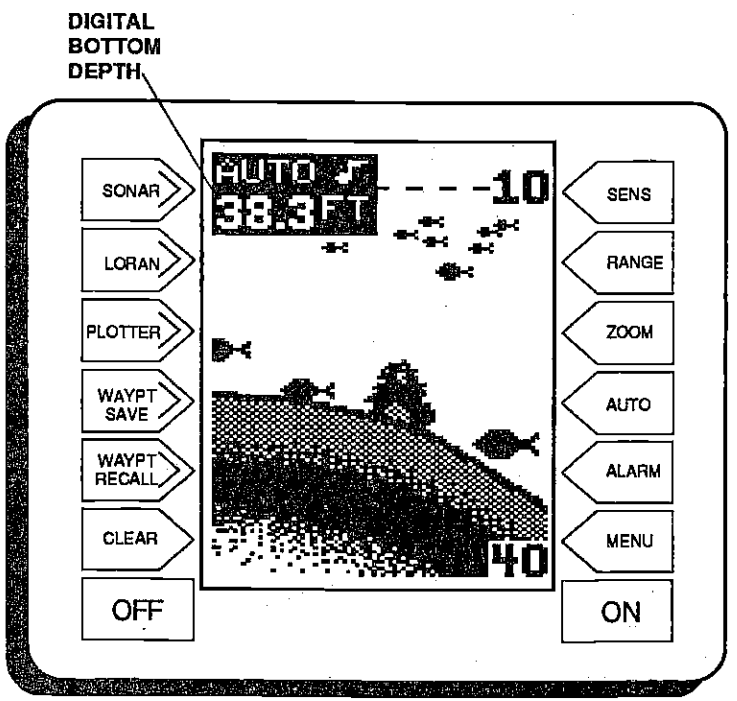
Both 8 degree and 20 degree transducers give accurate bottom readings, even though the bottom signal is much wider on the 20 degree model. This is because you are seeing more of the bottom. Remember, the shallow edge of the signal shows you the true depth. The rest of the signal tells you whether you are over rocks, mud, etc.

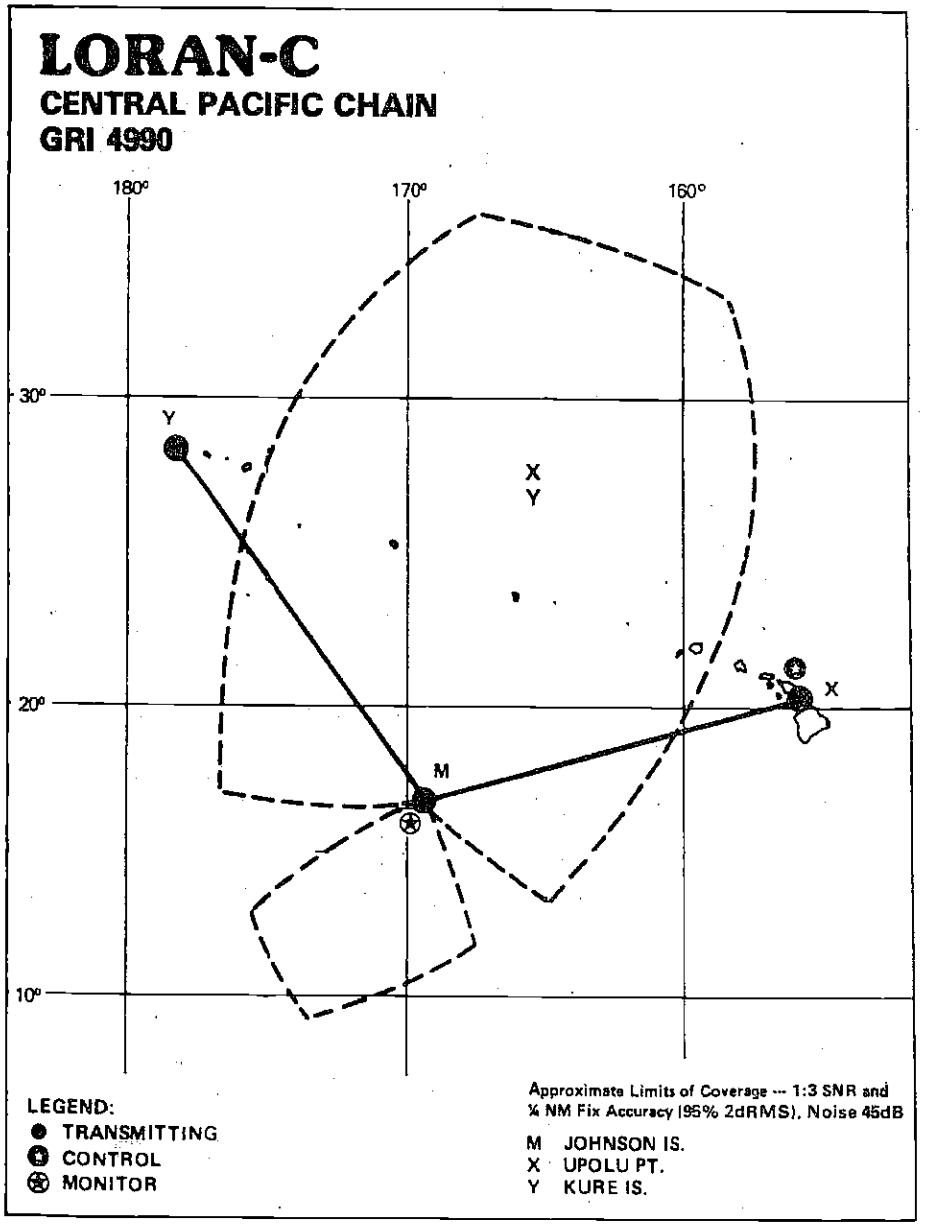
SIGNAL INTERPRETATION

Your UtraNav gives an accurate picture of the bottom that your boat is passing. A bottom of firm sand, gravel, shell, or hard clay returns a fairly wide signal. If the automatic mode is off and the signal narrows down, then it means that you have moved over a mud bottom. Mud absorbs the sound wave and returns a weak signal. Turn up the sensitivity to see a better bottom signal.

Big rocks or stumps on a smooth bottom send back signals above the bottom level signal. The height of the signal depends on the target's height. As you pass over a post, it should be clearly visible as a short line extending above the bottom signal.

A steep slope returns a wide signal, the steeper the wider. Signals returned from a high underwater cliff are usually the widest of all.





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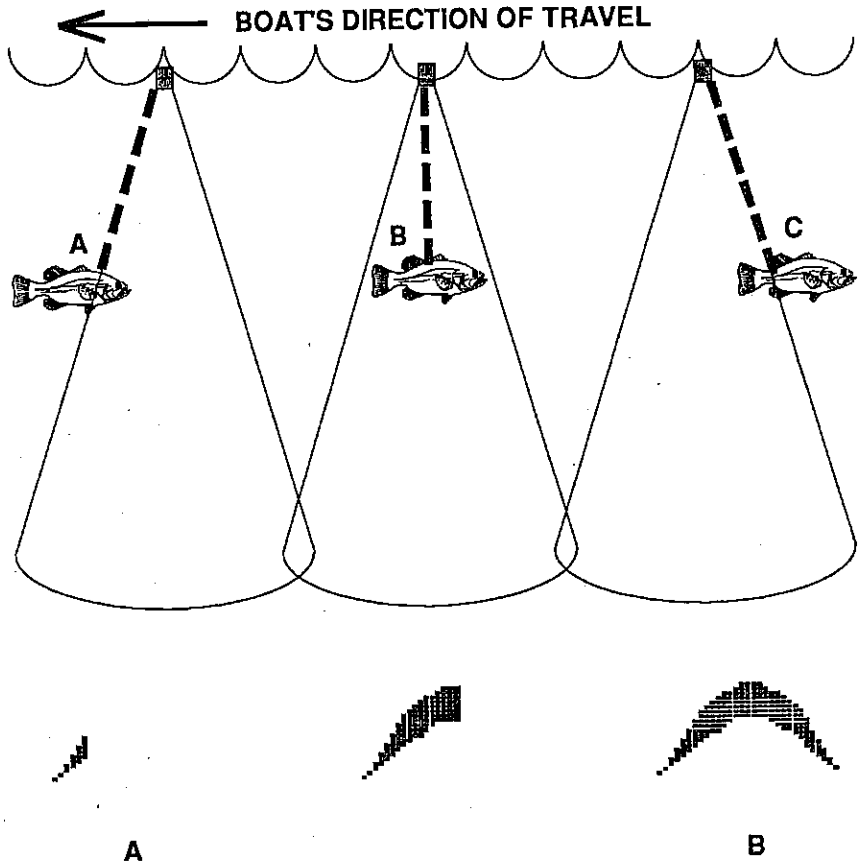
CENTRAL PACIFIC LORAN-C CHAIN GRI 4990
REGIONAL MANAGER: COMMANDER, PACIFIC AREA, ALAMEDA, CA
CHAIN MANAGER 14TH COAST GUARD DISTRICT, HONOLULU, HI
COORDINATOR OF CHAIN OPERATIONS LOCATION: OMSTA KANEOHE, HI
CONTROL SITE: OMSTA KANEOHE, HI

DESIG.	STATION	COOR.	CD/SLL (us)	XMITTER	PWR (KW)	TRANSMIT ANTENNA	NOM ECD	NOTES
MASTER	JOHNSTON ISLAND, HI	16 44 44.0N 169 30 31.2W		AN/FPN-42	325	625 FT MONOPOLE	0.0	
XRAY	UPOLU POINT HI	20 14 19.2N 155 53 09.7W	11000/ 4972.23	AN/FPN-42	325	625 FT MONOPOLE	0.0	
YANKEE	KURE ISLAND HI	28 23 41.8N 178 17 30.2W	29000/ 5253.16	AN/FPN-42	325	625 FT MONOPOLE	0.0	

FISH ARCHES

Fish arches are created when the cone of sound passes over a fish. The distance to a fish when the cone first strikes it is shown as "A" below. When the center of the cone strikes the fish, the distance is shorter as shown "B". As the cone leaves the fish, the distance increases again as shown in "C".



When the Fish I.D. mode is off, the depth of the water will affect the size and shape of the fish arch due to the cone angle diameter. For example, if the cone passes over a fish in shallow water, the signal displayed on the UltraNav may not arch at all. This is due to the narrow cone diameter and the resolution limitations of the display.

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Very small fish probably will not arch at all. Medium sized fish will show a partial arch, or a shape similar to an arch if they're in deep water. Large fish will arch, but turn the sensitivity up in deeper water to see the arch. Because of water conditions, such as heavy surface clutter, thermoclines, etc., the sensitivity sometimes cannot be increased enough to get fish arches.

One of the best ways to get fish arches is to expand or "zoom" a segment of the water. For example, from 45 to 60 feet. The smaller the segment, the better the screen resolution will be. The easiest way to do this on the UltraNav is with the Bottom Track feature. Use the 2x or 4x Bottom Track mode to expand the echoes, making it easier to see detail. For the best results, turn the sensitivity up as high as possible without getting too much noise on the screen. In medium to deep water, this method should work to display fish arches.

If you see fish signals when the unit is in the manual mode, but don't get fish symbols when the Fish I.D. feature is on, try increasing the sensitivity.

WATER TEMPERATURE AND THERMOCLINES

Water temperature has an important-if not controlling-influence upon the activities of all fish. Fish are cold blooded and their bodies are always the temperature of the surrounding water. During the winter, colder water slows down their metabolism. At this time, they need about a fourth as much food as they consume in the summer.

Most fish don't spawn unless the water temperature is within rather narrow limits. The surface temperature meter built into the Ultra Plus helps identify the desired surface water spawning temperatures for various species. Trout can't survive in streams that get too warm. Bass and other fish eventually die out when stocked in lakes that remain too cold during the summer. While some fish have a wider temperature tolerance than others, each has a certain range within which it tries to stay. Schooling fish suspended over deep water lie at the level that provides this temperature. We assume they are the most comfortable here.

3. If you're using the loran on land, keep away from trees, buildings, and (most important) power lines. The loran will not work inside a building, or under a metal carport, shed, etc.

(NOTE: These units are designed for marine (boating) purposes and generally work best on the water.)

4. If you're having trouble with the unit locking on to the stations, you may have a piece of gear such as a radio, bilge pump, or engine that is causing interference. First turn everything in the boat off, then try initializing the unit. Enter the initial position first. If that doesn't work, then try the GRI. If the unit still doesn't lock on, then look for other sources of interference. (see below)

INTERFERENCE SOURCES or BAD RECEPTION

Land Sources:

1. Military installations. (High power transmitters in the loran band.)
2. Hydro-electric plants. (Dams)
3. High voltage power lines. These radiate noise at high levels.
4. Storms. A storm between you and the loran station can interfere with the signals, even if it's many miles away.
5. Mountains, trees, buildings. These reflect the signals. Try to stay in an open area.

Boat Sources:

1. Boat engine. Resistor spark plugs help, alternator noise filter may also be required.
2. Power cable routed to fuse panel instead of directly to battery. Route the power cable directly to the battery.
3. Bad antenna placement. The antenna should be placed in an open area on the boat, away from other antennas or structure.
4. Fluorescent lights.

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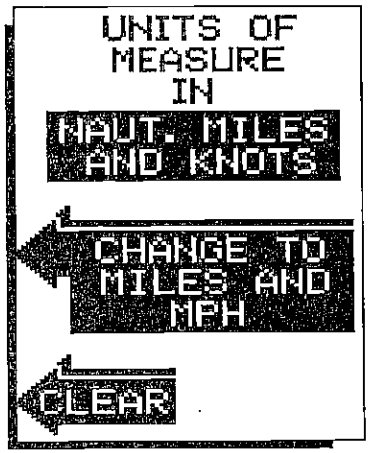
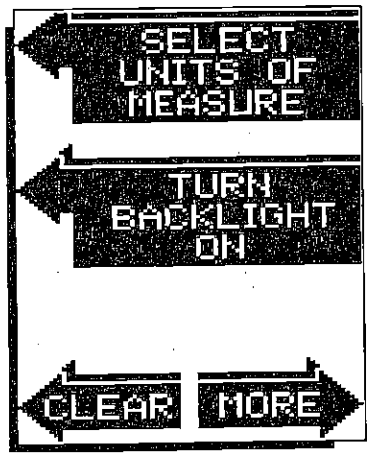


Simply press the key adjacent to the "CHANGE TO MILES AND MPH" label and the UltraNav will return to the last used loran screen, showing the new units of measure.

To switch back to nautical miles and knots, repeat the above steps. The menu will now read "CHANGE TO NAUT. MILES AND KNOTS". Press the key adjacent to that menu to switch the units of measure.

BACKLIGHTS

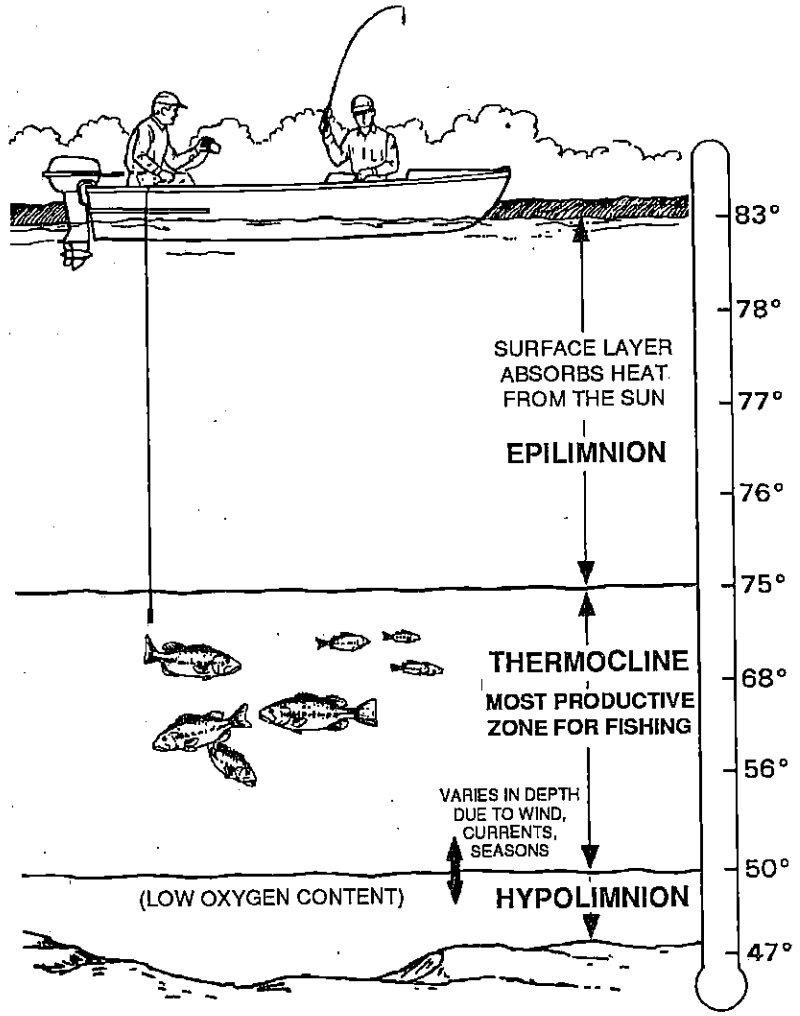
The UltraNav's keyboard and display are backlighted for night use. To turn the backlights on or off, press the MENU key, then press the key adjacent to the "CHANGE SETUP" label. Now press the MENU key three times. The screen at left appears. Simply press the key adjacent to the "TURN BACKLIGHT ON/OFF" label. If the lights are off, they will turn on. If they were on, this will turn them off.



LORAN TROUBLESHOOTING

1. You must have an 8' antenna. Preferably, the entire length of the antenna should be higher than anything else on the boat.

2. For best results, wire the power cable directly to the battery, preferably the main engine's cranking battery. This assures the boat will be grounded, since the lower unit is in the water. If you're using an isolated battery, wire a grounding plate to the ground side of the battery. The loran will work better if it's grounded to water.



The temperature of water in the lake is seldom constant from top to bottom. Layers of different temperatures form, and the junction of a warm and cool layer of water is called a thermocline. The depth and thickness of the thermocline can vary with the season or time of day. In deep lakes there may be two or more at different depths. Thermoclines are important to fishermen because they are areas where fish are active. Many times bait fish will be above the thermocline while larger game fish will suspend in or just below it.

The UltraNav can detect this invisible layer in the water, but the sensitivity will probably have to be turned up to see it.

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SURVEYING A LAKE

The most successful anglers on any body of water are those who fish it day after day and year after year. Eventually, they learn the hot spots that produce fish consistently. They discover through experience where, and at what depth, they can expect to find the fish they want at any season. And they realize that these productive areas change throughout the year depending on water level, temperature, food, and other factors.

With the Ultra, anyone can eliminate guesswork and concentrate on the areas where fish are likely to be. Even if it's the first time on the lake!

The most efficient way to become acquainted with a body of water is to survey it with your UltraNav. Start with a map of the lake, if possible, and indicate the promising spots in relation to landmarks on shore.

As you go about your survey, your UltraNav will tell you the depth and type of bottom. It will also reveal suspended fish.

Keep a few marker buoys in the boat, ready to toss overboard. When the Ultra indicates a school of fish, throw the buoy out. With the school thus marked, you can make your turn and come back to fish in exactly the right spot. This is essential when you're far from shore on a big lake. Unless you mark the school of fish when you're over it, you may not be able to find it again.

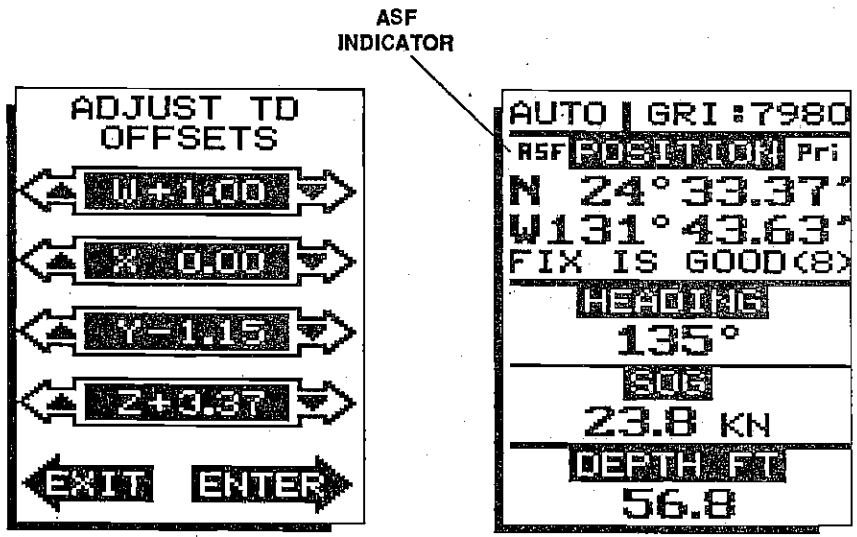
BAIT FISH

The importance of bait fish to successful fishing can't be over-emphasized. They are the principle food of all game fish in most waters.

Bait fish are the plankton feeding forage fish, such as minnows and shad. Bait fish can also be the young of game fish, such as crappies, bluegill, and bass.

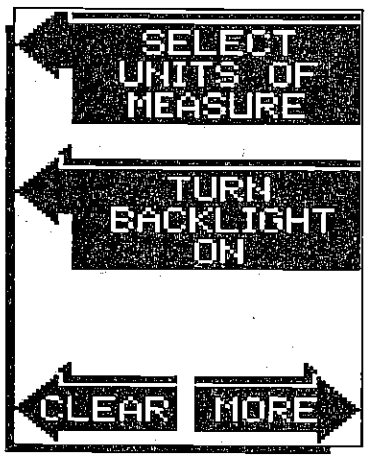
Most bait fish concentrate within five feet of the surface where sunlight promotes the growth of the plankton on which they feed. One method of fishing is to use the UltraNav to find the bait fish first. With the Fish ID feature off, A school of bait fish will look like a "cloud" on the display. Usually, game fish will be nearby, often directly beneath the school of bait fish.

Once the desired values are entered, press the key adjacent to the "ENTER" label. The UltraNav will return to the last used loran screen, using the corrections you entered. Switch to the position screen to see if ASF's are in use. The letters "ASF" appear in the upper left corner of the screen, immediately below the automatic/manual mode indicator.



SELECT UNIT OF MEASURE

The UltraNav can display distance in nautical or statute miles and speed in knots or miles per hour. When the UltraNav is turned on for the very first time, distance is in nautical miles and speed is in knots. To change the units of measure, press the MENU key while a loran screen is displayed, then press the key adjacent to the "CHANGE SETUP" label. Now press the MENU key three times. The screen shown at left appears.



Now press the key adjacent to the "SELECT UNITS OF MEASURE" label. The screen at the top of the next page appears.

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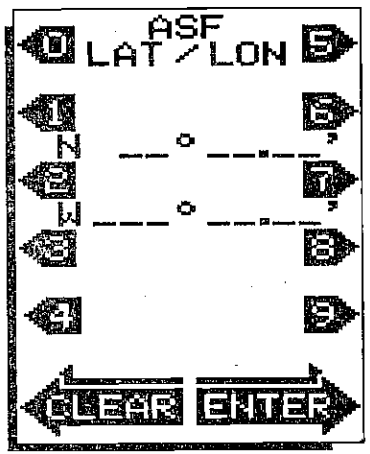
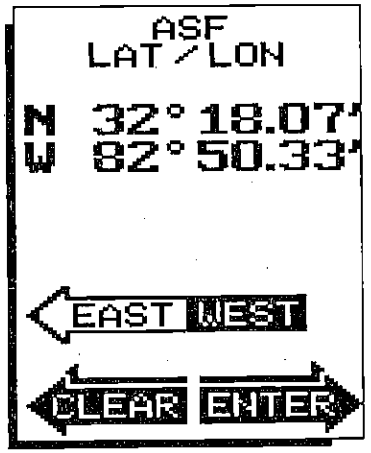
Now enter the exact latitude/longitude for your position. Remember to enter a zero at the beginning of the longitude if it's less than 100 degrees. The screen below right appears after the last longitude number is entered.

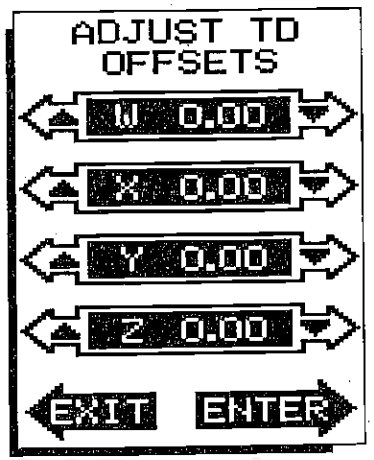




If you're east of Greenwich, England (east longitude), press the key adjacent to the EAST/WEST label. Otherwise, if everything on the screen is correct, press the key adjacent to the ENTER label. The UltraNav will return to the last used loran screen, using the position offset you entered.

TD OFFSET

To change the ASF using the TD offset method, press the key adjacent to the "ENTER TD CORRECTION" label on the ASF menu. The menu shown at right appears.



The offset or correction in microseconds is shown for each secondary in the chain. Press the key adjacent to the up or down arrows to change the TD offset. Press the key adjacent to the up arrrow to increase the value, or the down arrow to decrease it.

IMPORTANT SERVICE INFORMATION!

If your unit is not working, or if you need technical help, please use the following troubleshooting section before contacting a service center or the factory customer service department. It may save you the trouble of returning your unit. See the How To Obtain Service section on page 38 if you need service.

SONAR TROUBLESHOOTING

Unit won't turn on:

1. Check the power cable's connection at the unit. Also check the wiring.

2. Make certain the power cable is wired properly. The red wire connects to the positive battery terminal, black to negative or ground.

3. Check the fuse.

4. Measure the battery voltage at the unit's power connector. It should be at least 11 volts. If it isn't, the wiring to the unit is defective, the battery terminals or wiring on the terminals are corroded, or the battery needs charging.

Unit freezes, locks up, or operates erratically:

1. Electrical noise from the boat's motor, trolling motor, or an accessory may be interfering with the sonar unit. Re-routing the power and transducer cables away from other electrical wiring on the boat may help. Route the sonar unit's power cable directly to the battery instead of through a fuse block or ignition switch

2. Inspect the transducer cable for breaks, cuts, or pinched wires.

3. Check both the transducer and power connectors. Make certain both are securely plugged in to the unit.

Weak bottom echo, digital readings erratic, or no fish signals:

1. Make certain transducer is pointing straight down. Clean the face of the transducer. Oil, dirt, and fuel can cause a film to form on the transducer, reducing its effectiveness. If the transducer is mounted inside the hull, be sure it is shooting through only one layer of fiberglass and that it is securely bonded to the hull. Do NOT use RTV silicone rubber adhesive or Marinetex™.

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Weak bottom echo, digital readings erratic, or no fish signals (cont.):

2. Electrical noise from the boat's motor can interfere with the sonar. This causes the sonar to automatically increase its Discrimination or noise rejection feature. This can cause the unit to eliminate weaker signals such as fish or even structure from the display.

3. The water may be deeper than the sonar's ability to find the bottom. If the sonar can't find the bottom signal while it's in the automatic mode, the digital will flash continuously. It may change the range to limits far greater than the water you are in. If this happens, place the unit in the manual mode, then change the range to a realistic one, (for example, 0-100 feet) and increase the sensitivity. As you move into shallower water, a bottom signal should appear.

4. Check the battery voltage. If the voltage drops, the unit's transmitter power also drops, reducing its ability to find the bottom or targets.

Bottom echo disappears at high speeds or erratic digital reading or weak bottom echo while boat is moving

1. The transducer may be in turbulent water. It must be mounted in a smooth flow of water in order for the sonar to work at all boat speeds. Air bubbles in the water disrupt the sonar signals, interfering with its ability to find the bottom or other targets. The technical term for this is 'Cavitation'.

2. Electrical noise from the boat's motor can interfere with the sonar. This causes the sonar to automatically increase its Discrimination or noise rejection feature. This can cause the unit to eliminate weaker signals such as fish or even structure from the display. Try using resistor spark plugs or routing the sonar unit's power and transducer cables away from other electrical wiring on the boat.

No fish arches when the Fish ID feature is off:

1. Make certain transducer is pointing straight down. This is the most common problem if a partial arch is displayed. See the Fish Arch section in your owner's manual for more information.

2. The sensitivity may not be high enough. In order for the unit to display a fish arch, it has to be able to receive the fish's echo from the time it enters the cone until it leaves. If the sensitivity is not high enough, the unit displays the fish only when it is in the center of the cone.

3. Use the Zoom feature. It is much easier to display fish arches when zoomed in on a small range of water than a large one. For example, you will have much better luck seeing fish arches with a 30 to 60 foot range than a 0 to 60 foot range. This enlarges the targets, allowing the display to show much more detail.

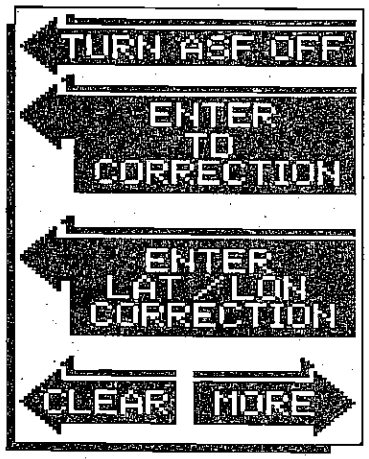
IMPORTANT!

ASF corrections entered by the user are good only for the stations in use at the time and location being corrected. If you travel away from the area, the ASF correction may not be valid. ASF corrections may not be usable if you change stations, or if the unit automatically changes stations. This especially holds true if you enter a latitude/longitude position to change ASF. The UltraNav will only apply the ASF correction to the stations in use - not all of them. Remember, if you change stations, especially if you change GRI's, the ASF will have to be re-entered.

To change the ASF, first press the MENU key while a loran screen is displayed. Now press the key adjacent to the "CHANGE SETUP" label. Press the MENU key one more time, then press the key adjacent to the "ADJUST ASF" label. The screen shown below appears. This menu lets you change the ASF using TD offsets or latitude/longitude correction. Entering the ASF correction automatically turns the ASF feature on.

Latitude/Longitude ASF Correction

Use the lat/long ASF correction if the latitude/longitude position shown on the display is slightly different than your known, precise position. (If the displayed position is off by a large margin, the Alternate/Primary feature may need to be switched.) For example, suppose your actual latitude/longitude is 38-25-40/81-34-10, but the UltraNav displays 38-24-30/81-35-20. Simply enter your actual position, and the UltraNav will handle the rest.



To change the ASF using the latitude/longitude correction, *you first must be in the location you are changing.* Next, press the key adjacent to the "ENTER LAT/LONG CORRECTION" label. The screen at the top of the next page appears.

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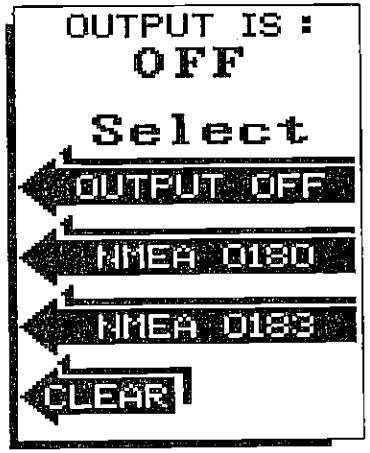
NMEA INTERFACE

The UltraNav can send data out according to NMEA 0180 or 0183 formats. The NMEA output is turned off when the UltraNav is turned on for the very first time.



To select the NMEA output, press the MENU key while a loran screen is displayed. Now press the key adjacent to the "CHANGE SETUP" label. Next, press the MENU key two times. Finally, press the key adjacent to the "SELECT NMEA OUTPUT" label. The screen shown below appears.

Simply press a key adjacent to the desired output. The NavGuide will return to the last loran screen and output data on the white serial data wire. (See the Power Connections section for wiring instructions.)

ASF Correction

Loran signals are affected by the terrain they travel over. Plains, lakes, mountains, and cities affect the signal and they each affect it in different ways. This effect is called the additional secondary phase factor, or ASF. It's usually factored in when a loran chart is made. However, ASF's vary from place to place, so there can be differences between the chart and the real world.

There can also be a difference in your actual position and the one displayed by the loran, due to ASF. In this case, the loran signals are distorted from their theoretical position. Since the measured TD's are shifted, the loran shows a TD or latitude/longitude that is not the actual position.

The UltraNav has an correction feature that lets you change the ASF. This forces the loran to use a new ASF instead of the one that resides in its memory. You can shift the ASF by changing the TD offset or by entering your actual latitude/longitude position.

4. The boat must be moving at a slow trolling speed to see fish arches. If the boat is motionless, fish stay in the cone, showing on the display as straight horizontal lines.

ELECTRICAL NOISE

A major cause of sonar problems is electrical noise. This usually appears on the sonar's display as random patterns of dots or lines. In severe cases, it can completely cover the screen with black dots, or cause the unit operate erraticly, or not at all.

To eliminate or minimize the effects of electrical noise, first try to determine the cause. With the boat at rest in the water, the first thing you should do is turn all electrical equipment on the boat off. Make certain the engine is off, also. If your unit does NOT have ASP (Advanced Signal Processing), or if you can turn ASP off, turn on your sonar unit. There should be a steady bottom signal on the display. Now turn on each piece of electrical equipment on the boat and view the effect on the sonar's display. For example, turn on the bilge pump and view the sonar display for noise. If no noise is present, turn the pump off, then turn on the VHF radio and transmit. Keep doing this until all electrical equipment has been turned on, their effect on the sonar display noted, then turned off. If your unit has ASP, and you can't turn it off, first turn on each piece of electrical equipment on board, one at a time, then turn on the sonar unit. You will have to look quickly for noise, since the ASP feature starts eliminating noise from the display a few seconds after the unit is turned on.

If you find noise interference from an electrical instrument, trolling motor, pump, or radio, try to isolate the problem. You can usually re-route the sonar unit's power cable and transducer cable away from the wiring that is causing the interference. VHF radio antenna cables radiate noise when transmitting, so be certain to keep the sonar's wires away from it. You may need to route the sonar unit's power cable directly to the battery to isolate it from other wiring on the boat.

If no noise displays on the sonar unit from electrical equipment, then make certain everything except the sonar unit is turned off, then start the engine. Increase the RPM with the gearshift in neutral. If noise appears on the display, the problem could be one of three things; spark plugs, alternator, or tachometer wiring. Try using resistor spark plugs, alternator filters, or routing the sonar unit's power cable away from engine wiring. Again, routing the power cable directly to the battery helps eliminate noise problems. Make certain to use the in-line fuse supplied with the unit when wiring the power cable to the battery.

When no noise appears on the sonar unit after all of the above tests, then the noise source is probably cavitation. Many novices or persons with limited experience make hasty sonar installations which function perfectly in shallow water, or when the boat is at rest. In nearly all cases, the cause of the malfunction will be the location and/or angle of the transducer. The face of the transducer must be placed in a location that has a smooth flow of water at all boat speeds. Read your transducer owner's manual for the best mounting position.

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How to Obtain Service

We back your investment in quality products with quick, expert service and genuine Eagle replacement parts. If you need service or repairs, contact the authorized Eagle Service Center nearest you. The enclosed Service Center List will help you find the closest repair facility. If desired, you can contact the Factory Customer Service Center. Transportation expenses to us or to the Authorized Service Center are your responsability. The product will be returned to you by surface carrier at no charge.

Factory Repair

If your unit needs repair, and you wish to write or send a product to the factory, use the following address:

EAGLE ELECTRONICS
Att: Service Department
12000 E Skelly Dr
Tulsa, OK 74128-2486

You can call or write to an authorized Eagle Service Center or the Factory Customer Service Department before sending your unit in for repair. A technician may be able to solve the problem and save you the inconvenience of returning your unit.

For the Eagle factory customer service department, call 1-918-234-1452.

When sending a product to the factory or a service center, we recommend you do the following:

1. Use the original box and filler material the product was packed in when shipping your product.

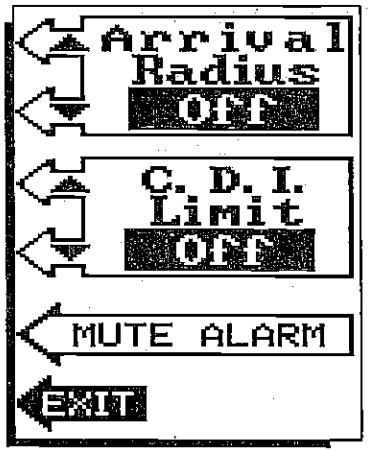
2. Always insure the parcel against damage or loss during shipment.

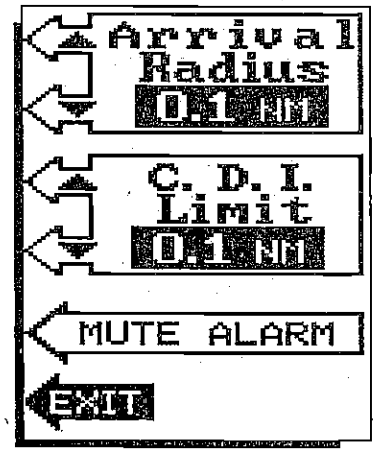
3. For proper testing, repair, and service, send a brief note with the product describing the problem. Be sure to include your name, return shipping address, and a daytime telephone number.

IMPORTANT: Be sure to include proof of purchase when sending the product if it is still in warranty.

ARRIVAL ALARM

The arrival alarm sounds a tone when your position is within the alarm's radius of a waypoint. For example, the alarm will sound if you come with .1 nautical miles of a waypoint if the arrival alarm's setting is .1 nautical mile.





To adjust the arrival alarm, press the ALARM key while a loran or plotter screen is displayed. The screen shown above left appears. Press the key adjacent to the up arrow on the arrival alarm's menu to increase the radius, the down arrow to decrease it or turn it off. Press the key adjacent to the EXIT label to return to the loran screen.

C.D.I. ALARM

The C.D.I. alarm sounds when you are off course by the same amount as the alarm setting. For example, if the alarm setting is .1 nautical miles, then the alarm will sound if you're off course by .1 nautical miles. The C.D.I. alarm adjust also changes the C.D.I. range on the Steering Screen.

To adjust the C.D.I. alarm, press the ALARM key while a loran screen is displayed. The screen shown above left appears. Now press the key adjacent to the up arrow on the C.D.I.'s alarm menu to increase it, the down arrow to decrease it or turn it off. If the alarm is turned off, the C.D.I. indicator's limits are preset to .1 nautical mile. Press the key adjacent to the EXIT label to return to the loran screen.

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each waypoint, the UltraNav will automatically switch to the next waypoint on the list. This continues until you've travelled the entire route.

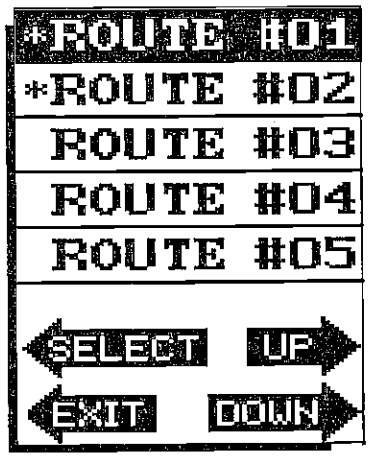
Canceling a Route

To stop the UltraNav from navigating a route, press the MENU key, then press the key adjacent to the ROUTES label. Now press the key adjacent to the CANCEL ROUTE label. The UltraNav will stop sequencing through the waypoints on the route. However, it will still show navigation data to the last waypoint in use.

Erasing a Route

To erase a route, press the MENU key, then press the key adjacent to the "ROUTES" label. Now press the key adjacent to the "ERASE ROUTE" label. The screen shown below appears.

The asterisk shown to the left of Route 1 and Route 2 signifies that these routes have waypoints saved. To erase Route 1, simply press the key adjacent to the "SELECT" label. To erase Route 2, or any other route that has the asterisk displayed, use the keys adjacent to the up or down arrows. This moves the list of routes up or down. When the desired route is in the selection box at the top of the screen, press the key adjacent to the "SELECT" label. The route will be erased, and the UltraNav will return to the last loran screen.



LORAN ALARMS

The UltraNav has two loran alarms. One is an arrival alarm that sounds when you come within a preset distance to a waypoint. The other is a C.D.I. alarm that sounds when you move off course more than the alarm's set point.

ULTRANAV
LORAN OPERATION

WARNING!
USE THIS LORAN RECEIVER ONLY AS AN AID TO NAVIGATION. A CAREFUL NAVIGATOR SHOULD NEVER RELY ON ONLY ONE METHOD TO OBTAIN POSITION INFORMATION.

NOTICE!
MAKE CERTAIN THE LORAN IS DISPLAYING THE CORRECT POSITION IN *LATITUDE/LONGITUDE* COORDINATES BEFORE NAVIGATING WITH THIS UNIT. THE POSITION MUST BE CORRECT FOR THE NAVIGATION FEATURES TO WORK PROPERLY.

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LORAN TABLE OF CONTENTS

LORAN - GENERAL 41
ACCURACY 41
HOW LORAN-C WORKS 42
INSTALLATION - ELC-1 LORAN MODULE 43
OPERATION 44
INITIALIZATION 44
- SELECT GRI 45
- SELECT INITIAL POSITION 46
- STATION DATA SCREEN 47
- AUTOMATIC AND MANUAL MODES 48
- MANUAL STATION SELECTION 49
- PRIMARY AND ALTERNATE SOLUTIONS 50
- SHOW TD'S 51
- TRUE AND MAGNETIC POSITION 52

LORAN DISPLAYS 53
- POSITION SCREEN 53
- STEER INDICATOR AND NAVIGATION SCREEN 54
- NAVIGATION SUMMARY SCREEN 55

PLOTTER 56
- USING THE PLOTTER WITH A WAYPOINT 57
- PLOTTER MENUS 57
- CLEAR PLOTTER 58
- SELECT PLOTTER RADIUS SIZE 58
- SELECT PLOTTER UPDATE RATE 58

WAYPOINT NAVIGATION 59
- HOW TO SAVE A WAYPOINT 59
- SAVING PRESENT POSITION AS A WAYPOINT (QUICK SAVE) 59
- SAVING PRESENT POSITION - VIEW AND SAVE 60
- ENTER NEW WAYPOINT/GO TO WAYPOINT 60
- WAYPOINT RECALL 62
- ERASE A WAYPOINT 62

ROUTES 63
- CREATING A ROUTE 63
- FOLLOWING A ROUTE 65
- CANCELLING A ROUTE 66
- ERASING A ROUTE 66

LORAN ALARMS 66
- ARRIVAL ALARM 67
- C.D.I. ALARM 67

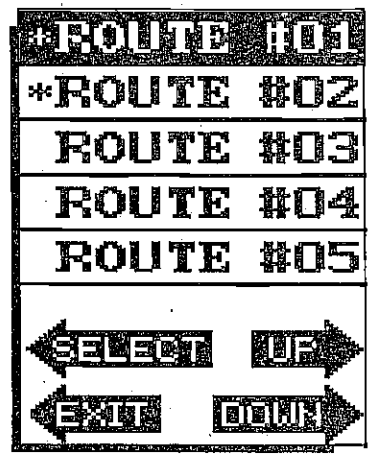
NMEA INTERFACE 68
ASF CORRECTION 68
- LATITUDE/LONGITUDE ASF CORRECTION 69
- TD OFFSET ASF CORRECTION 70

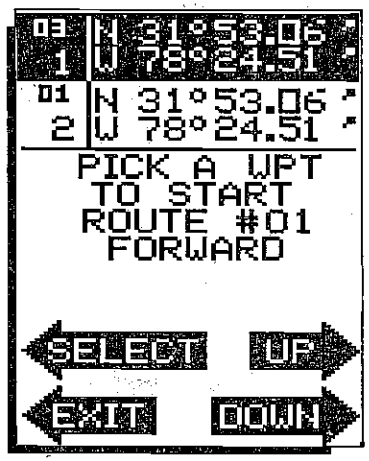
SELECT UNITS OF MEASURE 71
BACKLIGHTS 72
LORAN TROUBLESHOOTING 72

Following a Route

To follow a saved route, press the MENU key, then the key adjacent to the ROUTES label. Now press the key adjacent to the "RTE FORWARD" to follow a route from the first waypoint to the last, or "RTE BACKWARD" to follow a route from the last waypoint to the first. The screens are virtually identical, and instructions for both are the same. In this example, route forward is used. The screen below appears after the key adjacent to the "RTE FORWARD" label is pressed.

An asterisk appears to the left of the routes that have waypoints assigned. Move the list up or down using the keys adjacent to the up and down labels until the desired route is in the selection box at the top of the screen. Route number one is used in this example. Press the key adjacent to the "SELECT" label. The screen shown below appears.





Now choose the first waypoint to start the route. The default is waypoint number one, as shown in this example, however you can start the route from any waypoint in the route. The UltraNav will show navigation data to each consecutive waypoint in the route after the first waypoint is selected. Again, press the keys adjacent to the up and down labels until the desired waypoint is in the selection box at the top of the screen. Press the key adjacent to the "SELECT" label to choose the waypoint and start the route.

The UltraNav will show navigation and plotter information to each of the waypoints in the route. As you come within .1 nautical mile of

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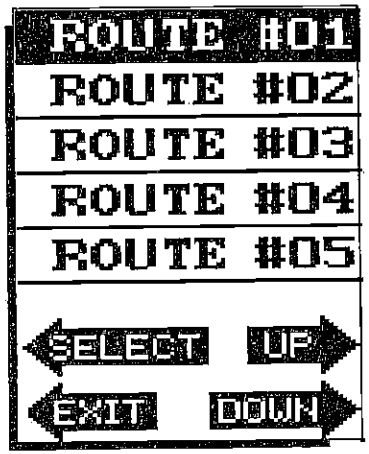
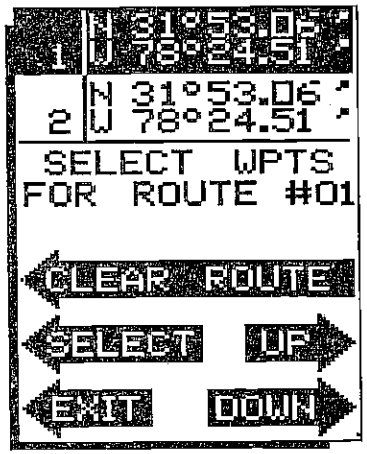
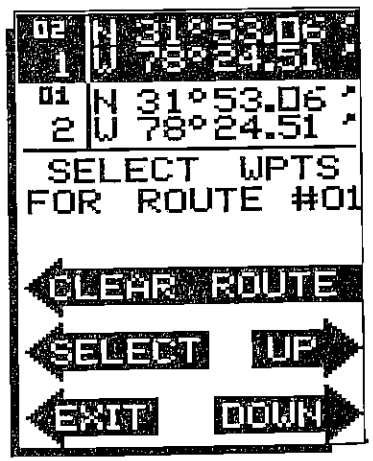
Once the desired route number is in the box, press the key adjacent to the "SELECT" label. In this example, route number one is used. The screen shown below appears next.





This is the waypoint selection menu. It lets you pick the waypoints for the route. Press the keys adjacent to the up or down arrows to scroll through the list of waypoints. When the first waypoint appears in the selection box at the top of the screen, press the key adjacent to the "SELECT" label. A small "01" appears above the waypoint's number. This lets you know that this is the first waypoint in the route.

Continue selecting waypoints in the order you wish to travel in the route until all of the desired waypoints have been picked for the route.
Each route can have up to ten waypoints. If you make a mistake and add an undesired waypoint to a route, press the key adjacent to the "CLEAR ROUTE" label. This erases all of the waypoints in the route. You can then start the selection process over again. After selecting all of the route's waypoints, press the key adjacent to the "EXIT" label. The UltraNav returns to the last used loran display.



Loran - General

NOTE:
This section covers the installation and operation of the UltraNav's Loran. The ELC-1 Loran-C module must be attached to the UltraNav for position information.

Loran is short for LOng RAnge Navigation. It's a navigation system that uses powerful low frequency (100 kHz) radio transmitters and sensitive receivers. Thus, you can determine your position over long distances.

Loran was developed and used during World War II. At that time it was called Loran-A and operated at a higher frequency. Research and development continued during the fifties. The current Loran version, Loran-C, was introduced in the sixties. It works over longer distances than Loran-A and it's easier to use.

ACCURACY

The absolute accuracy of Loran is between 0.1 and 0.25 nautical miles, depending on your location. Repeatable accuracy (your ability to return to the same spot) is 100 feet or better. The difference between the two types of accuracy is important. Absolute accuracy tells you where you are on the map. Repeatable accuracy lets you find your way back to the same site time after time.

However, the accuracy you experience may not be as good as the numbers above suggest. The crossing angle of the lines of position affects the accuracy. The sharper the crossing angle, the more chance for position error. A ninety degree crossing angle is best, but it can vary down to thirty degrees without a large position error.

If you wish to double check your Loran, first pick a spot on the chart that is clearly marked with latitude/longitude marks. Then go to it. Once you arrive, let the Loran settle, then compare the position information on the UltraNav to the chart. It should be very close.

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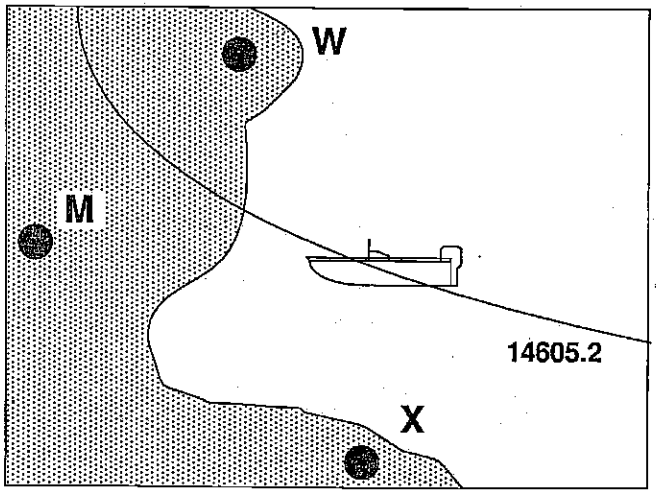
HOW LORAN-C WORKS

The Loran system consists of three to five transmitter stations. These are called a "chain." The letter "M" designates the master station inside the chain. The other stations in the chain are the secondaries. Their names are W, X, Y, and Z, although not all chains have four secondary stations. The secondary transmitters are synchronized with the master which transmits at precise time intervals. This time interval is called the Group Repetition Interval or GRI. Each chain has a different GRI.

The secondary stations transmit at precise time intervals after the master station transmits. Since these transmitters are located hundreds of miles apart, it takes a different time for the signals from each transmitter to reach you. The Loran receiver measures this time difference between the master and two of the secondaries. The UltraNav automatically chooses the best master-secondary pairs for your location. The time difference or (TD) is measured in microseconds. Plotting the TD on a chart with Loran-C lines results with your position somewhere on a line of position (LOP). A line of position is an imaginary line on which the time delay between the master and one of the secondaries is the same. In this example the boat is located somewhere on the 14605.2 LOP.



The Loran receiver then measures the time difference between the master and another secondary. The example on the next page is 31882.8. If you plot this LOP on a chart, you'll notice that it crosses the first line-of-position. Your position is at the intersection of the two lines.

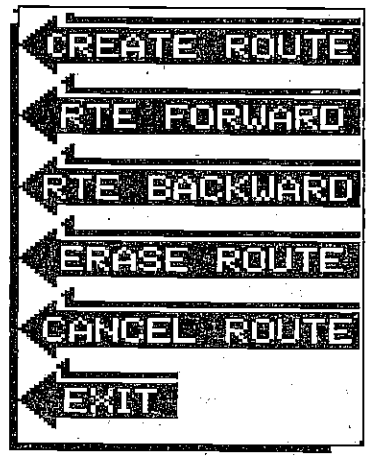
ROUTES

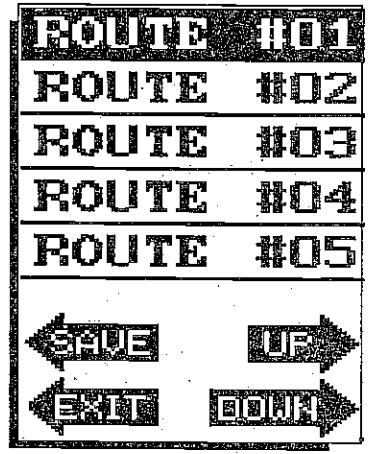
The UltraNav gives you the ability to go to several waypoints in a row. This feature is called Routes. A route consists of two or more waypoints. When you run a route, the UltraNav gives you navigation information to the first waypoint in the route. As you reach the first waypoint, the arrival alarm sounds, then the next waypoint is automatically selected by the unit. Navigation information is displayed for this waypoint until the arrival alarm sounds and the process repeats for the next waypoint. This happens until you've travelled to all the waypoints in the route.

There are two steps necessary to create a route. First, you must select the route number. Then pick the waypoints to use in the route. To follow a route, you simply determine the starting waypoint, then decide whether to follow the route forward or backward. After these steps are completed, the UltraNav will start navigating on the route.

Creating a Route

To create a route, first press the MENU key while the unit is in the loran mode. The menu on the left appears. Now press the key adjacent to the ROUTES label. The screen shown below left appears. Next, press the key adjacent to the "CREATE ROUTE" label. The screen shown below right appears.





The UltraNav has the capability to store twenty routes. Routes number one through five are displayed on the screen. Press the key adjacent to the up or down label to move the desired route number into the selection box at the top of the screen.

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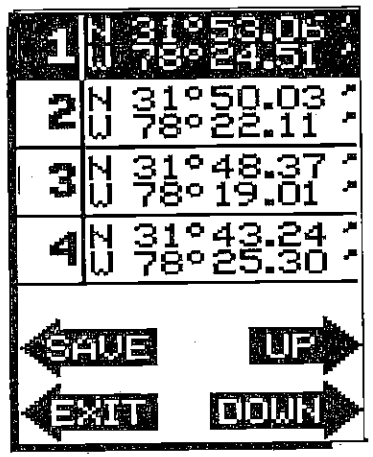
WAYPOINT RECALL

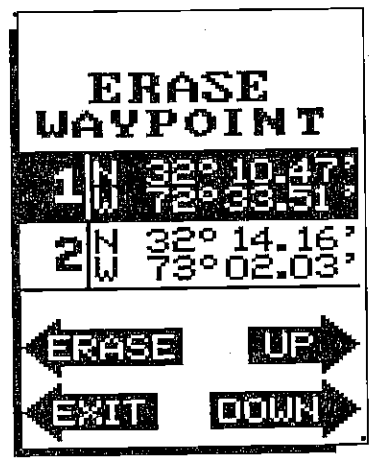
You must recall a waypoint to use the Steer Indicator or Navigation screens. To recall a waypoint, first press Waypoint Recall key. The menu shown below appears.

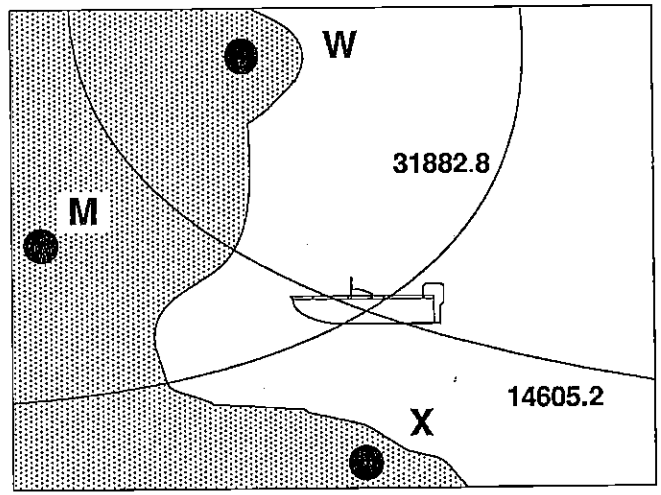


Four waypoints display on this screen. To recall one of these waypoints other than the one at the top of the screen, simply press the key adjacent to the up or down labels. This moves the list of waypoint numbers up or down. When the desired waypoint number appears in the reverse video area at the top of the screen, press the key next to the SELECT label. The waypoint displayed at the top of the screen will be recalled and the UltraNav will return to the loran screen. To exit from this screen without recalling a waypoint, simply press the key adjacent to the EXIT label.

ERASE A WAYPOINT

To erase a position from the waypoint list, first press the WAYPOINT SAVE key. Now press the key adjacent to the "ERASE A WAYPOINT" label. This screen appears. Simply press the keys adjacent to the up or down labels to move the list of waypoints up or down until the desired waypoint is in the black selection box. Now press the key adjacent to the "ERASE" label. This will erase the waypoint from the UltraNav's memory. To return to the last used loran screen, press the key adjacent to the "EXIT" label.





All Loran-C receivers work on this principle. Most modern receivers also display latitude/longitude. The receiver takes the TD information and, using a complex mathematical formula, converts it to latitude/longitude position data. You can display both TD's and latitude/longitude on the UltraNav to determine your position.

If you wish to know more about Loran-C, order the United States Coast Guard's book "Loran-C USER HANDBOOK." It's an excellent book that describes Loran in greater detail.

Loran-C User's Handbook
COMDTINST M16562.3
Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402
Code #050-012-00171-5, 1980

There is a small charge for the book.

INSTALLATION - ELC-1 Loran-C MODULE

When choosing a mounting location, remember to install the ELC-1 where it's clear of other antennas, wires, masts, or other obstructions. A high location is preferred, however for lightning protection, the antenna shouldn't be the highest part of the boat. The antenna should be mounted vertically. Make certain it is as far away as possible from VHF radio antennas.

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Improper performance can also occur if the antenna is mounted too close to metal objects such as tuna towers. Again, a location that places the Loran assembly in the clear is preferable to one that is high and obstructed.

You must purchase an eight foot stainless steel or fiberglass whip antenna. The threads are standard 3/8"-24 for the whip. A ratchet mount base is most commonly used to mount the Loran to the boat. The base mounting threads are conventional 1"-14 machine thread (NOT pipe thread). This allows the use of standard antenna mounting hardware. Tighten all hardware securely.

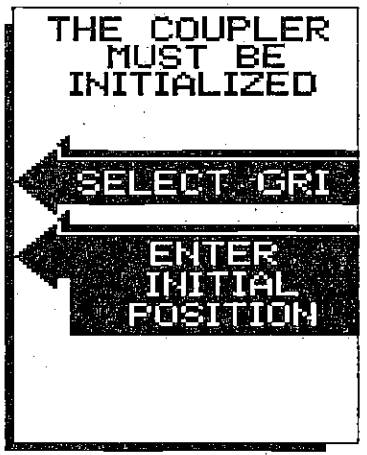
The cable supplied with the ELC-1 is thirty feet long. Do not cut the cable if it's too long. Instead, coil and store it out of the way. An extension cable is available if the cable is too short. Ask your dealer or call your local service center or the Eagle Factory Customer Service department for more information.

The ELC-1 can be attached to a swivel bracket or hollow extension mast, if desired.

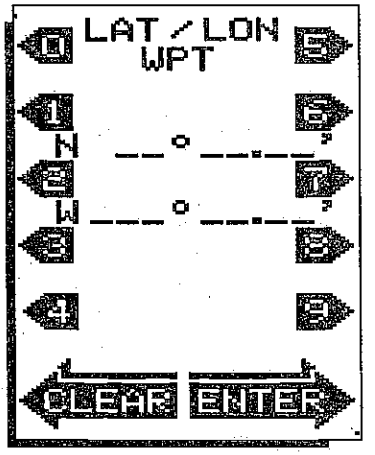
OPERATION

INITIALIZATION

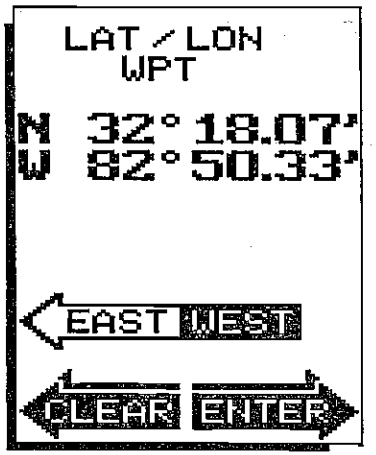
The Loran must be initialized or "told where it is" the very first time it's used. Once it finds your present position, the UltraNav stores it each time power is turned off. If you don't travel over approximately one hundred miles from the last time you turned the loran off, you shouldn't have to repeat this step.



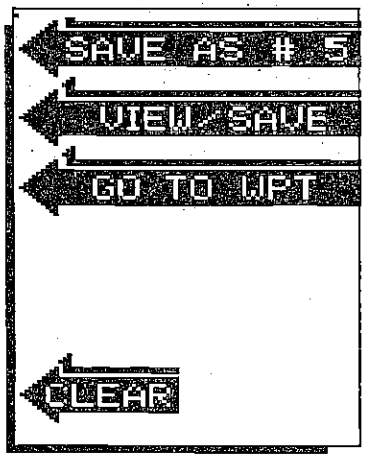
When the UltraNav is turned on for the very first time, and you press the LORAN key, the screen shown at right appears. To initialize the loran using the GRI search, press the key adjacent to the "SELECT GRI" label. If you know your present position, and you want the loran to choose the GRI, press the key adjacent to the "ENTER INITIAL POSITION" label.



Now enter the waypoint location. Remember to add a zero to the longitude if it's less than 100 degrees. The screen shown below appears after the last longitude number is entered.



If you are east of Greenwich, England (east longitude), press the key adjacent to the EAST/WEST label. Otherwise, if everything on this screen is correct, press the key adjacent to the ENTER label.
The screen below appears next.



This menu gives you three choices. You can save the waypoint under the next available number, using the "SAVE AS #" label at the top of the screen. The VIEW/SAVE menu stores the waypoint under any number you desire. (See the Saving Present Position -View and Save Method.) Finally, you can travel directly to the waypoint and not save it by pressing the key adjacent to the "GO TO WPT" label.

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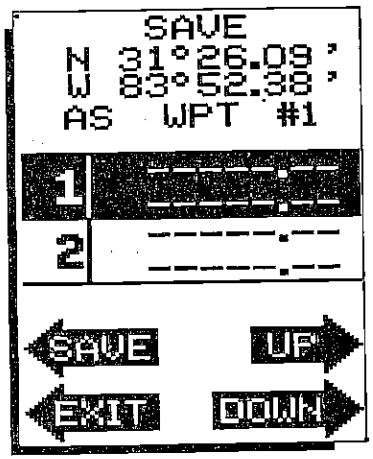
The waypoint number increments each time you save a waypoint, so you don't have to keep track of the waypoint numbers. Once you've stored the waypoint, the UltraNav returns to the loran display.

TIP

Save your home dock or launching ramp as waypoint number one. It's easy to remember home is number one when you want to return.

Saving Present Position - View and Save Method

The "Quick Save" feature doesn't allow the selection of a waypoint number. You have to use the next available number when using that method. To save your present position under any waypoint number, first press the Waypoint Save key, then press the key adjacent to the "VIEW/SAVE" label. The screen shown below appears.



Your present position displays at the top of the screen. If you want to save this waypoint under a number other than the one displayed, simply press the key adjacent to the up or down labels. This moves the list of waypoint numbers up or down. When the desired waypoint number appears in the reverse video area, press the key next to the SAVE label. The waypoint displayed at the top of the screen will be saved under this number, then the UltraNav will return to the loran screen. To exit from this screen without saving a waypoint, simply press the key adjacent to the EXIT label.

Enter New Waypoint / Go To Waypoint

To save a waypoint other than your present position, first press the Waypoint Save key. The waypoint save menu appears. If you wish to save the waypoint using latitude/longitude, press the key adjacent to the "INPUT LL WPT" label. To save a waypoint using TD's, press the key adjacent to the "INPUT TD WPT" label. The steps to save a waypoint are identical. For this example, we'll use the latitude/longitude method. The screen at the top of the next page appears.

(Note: You can re-initialize the loran at any time. The Select GRI and Initial Position features are menu items. The following section on these features tell how to access these features from the menus. The initialization is identical.)

SELECT GRI

Use this function if you don't know your position. The UltraNav will calculate your present position using the chain you select. See the charts in the back of this manual for the proper chain to use in your area. Once you know the chain's number, press the menu key while the loran screen is displayed. Now press the key adjacent to the "CHANGE SETUP" label. Finally, press the key adjacent to the "SELECT GRI" label. A screen similar to the one shown below appears. The GRI for the chain is shown at the top of the screen. The chain's name is right below the GRI. In this example, GRI 7980 is shown.

To change the GRI, press the key adjacent to the up or down labels. This scrolls the chains through the display window. When the desired chain is displayed in the window, press the key adjacent to the SELECT label. The UltraNav will revert to the last used loran screen and place the following message in a window on the screen; "Searching for GRI". The UltraNav then looks for the stations within the selected chain. Once it finds the stations, it processes the signals until it "locks on" to each station in the chain. It doesn't need to find and lock onto all the stations in a chain to determine the latitude/longitude. However, it does need to lock onto three stations with good signals to calculate a latitude/longitude. To view the UltraNav's loran station acquisition and signal strengths, see the "STATION DATA" section in this manual. Until the loran finds all of the necessary stations in the chain and locks onto them, it flashes the latitude/longitude. This means the latitude/longitude display is not usable. When the position numbers stop flashing, the loran is ready for use.

WARNING: DO NOT NAVIGATE WHEN THE POSITION DISPLAY (EITHER LAT/LONG OR TD'S) IS FLASHING!

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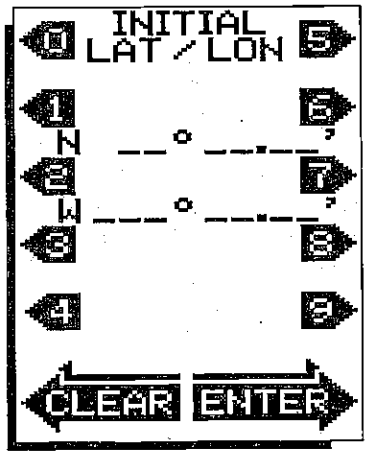
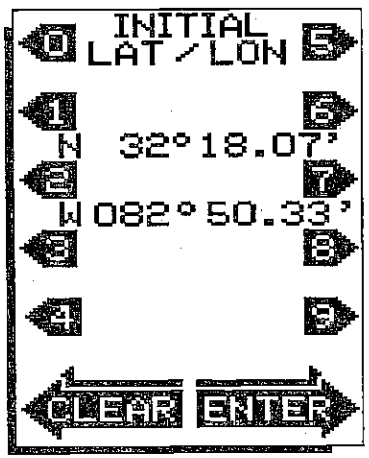
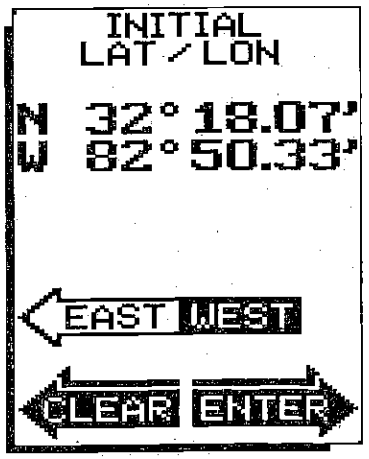
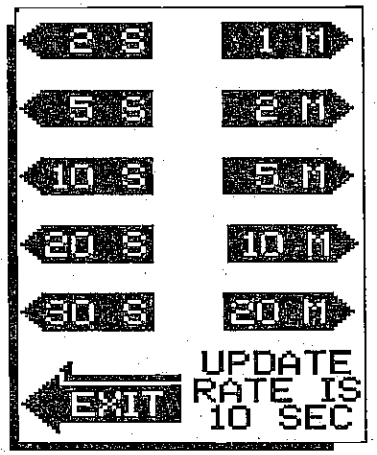
SELECT INITIAL POSITION

To initialize the UltraNav using the initial position method, first press the menu key while the unit is in the loran mode. Next, press the key adjacent to the "CHANGE SETUP" label. Finally, press the key adjacent to the "ENTER INITIAL POSITION" label. The screen shown on the right appears. Now enter your present position in latitude/longitude coordinates. Remember to enter a zero at the beginning of the longitude if it is less than one hundred degrees. The screen shown below right appears after the last longitude number is entered. If you are east of Greenwich, England (east longitude), press the key adjacent to the EAST/WEST label. Otherwise, if everything on this screen is correct, press the key adjacent to the ENTER label. A message "SEARCHING FOR GRI" scrolls on the screen until the UltraNav finds the stations in the chain and starts working on cycle selection. To view the station acquisition and signal strengths, see the "STATION DATA" section in this manual. Until the loran finds all of the necessary stations in the chain and locks onto them, it flashes the latitude/longitude. This means the latitude/longitude display is not usable. When the position numbers stop flashing, the loran is ready for use.









To keep a continuous line plotted, you may want to experiment with the update interval. Lengthening the interval between plots gives you a better chance to see more history.

To change the plotter time, press the key adjacent to the "Select Update Rate" label on the plotter menu screen. To select an update interval, simply press the key adjacent to the desired time. The screen will clear, returning you to the plotter with the new time. The available times are: 2, 5, 10, 20, and 30 seconds and 1, 2, 5, 10, and 20 minutes.

WAYPOINT NAVIGATION

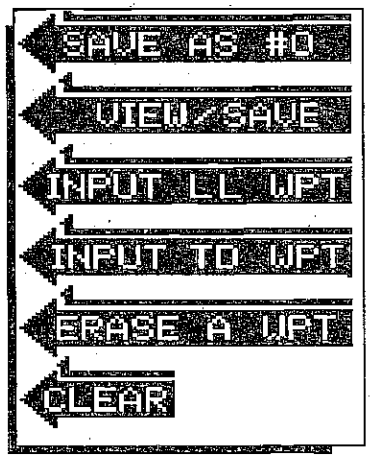
HOW TO SAVE A WAYPOINT

Waypoints are locations that you save in the UltraNav's memory. You can then navigate to these positions using the Steer Indicator, Navigation, or Plotter screens. Waypoints are useful for marking shipwrecks, hot fishing spots, and other fishing or navigational locations. The UltraNav can store up to 100 waypoints. You can store your present position as a waypoint, or enter TD's or latitude/longitude positions as waypoints.

Saving Present Position as a Waypoint (Quick Save Feature)

The UltraNav lets you save your present position with only two key presses. This "Quick Save" feature lets you save the position of a wreck or other objects quickly and easily.

To save your present position as a waypoint, first press the Waypoint Save key. The menu shown below appears. Now simply press the key adjacent to the "SAVE AS #0" label.



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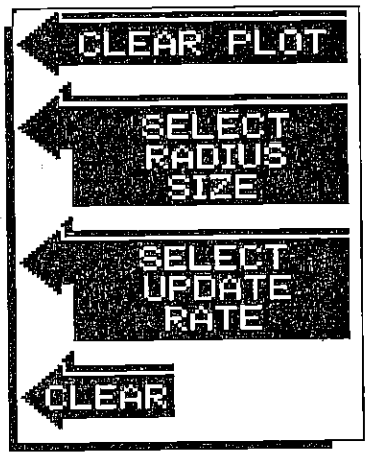
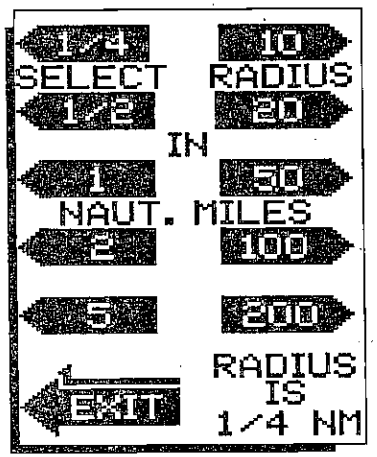
PLOTTER MENUS (cont.)

Clear Plot

The "Clear Plot" label clears the solid track line. The plotter will continue to draw your track after this key is pressed, however the location of your present position will be centered on the screen.





Select Radius Size

This menu allows the changing of the circle's radius on the plotter screen. The plot radius is 1/4 nautical mile when the UltraNav is turned on for the very first time. The available plot radii are: 1/4, 1/2/, 1, 2, 5, 10, 20, 50, 100, and 200 nautical miles. This lets you zoom in or zoom out the plotter's display. To select a radius, simply press the key adjacent to the desired radius size. The screen will clear, returning you to the plotter with the new radius.

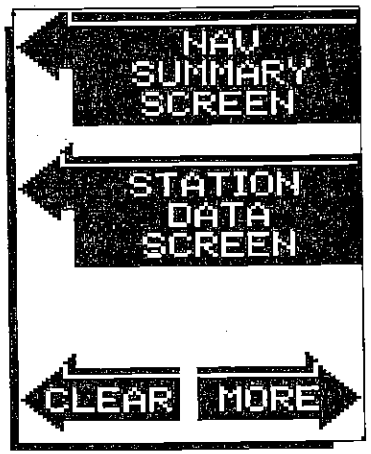
Select Update Rate

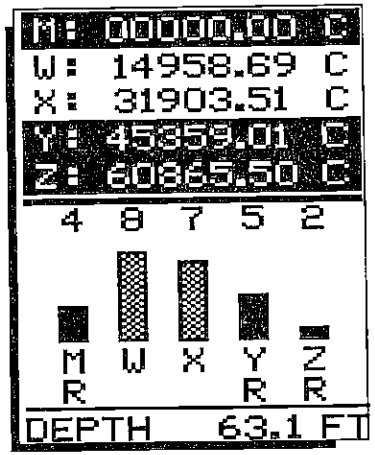
The plotter shows your track by drawing a solid line behind your present position. When the unit is turned on for the very first time, the position is updated once every ten seconds. You can vary this time from 2 seconds to 20 minutes.

As each dot is placed on the track line, one is erased from the end after a certain length has been achieved. This shortens the plotted line, but still shows the history of your passage. If you plot a course that's a long distance away and use a short update time, the line may not reach from the starting location to the destination.

STATION DATA

The UltraNav's Station Data Screen displays all of the technical data for the stations in the current GRI. To view this screen, press the MENU key two times. The screen shown below left appears. Now press the key adjacent to the "STATION DATA SCREEN". The screen shown below right appears. The TD's for the master station and all of the secondaries in the chain display at the top of the screen. Stations that are currently in use are shown in reverse video. In this example, the master and stations Y and Z are in use.





The letter on the far right side of the screen is an abbreviation for the station status. The status is as follows:

S - SEARCH Searching for the station's signal. Do not use this TD for navigation.

C - CYCLE ERROR The receiver is trying to "lock on" to the proper cycle. Do not use this TD for navigation.

L - LOCKED The receiver has locked on to the station. Use a TD only when the "L" indicator displays.

N - SNR The receiver has a low signal to noise ratio for this station. Do not use this TD for navigation.

B - BLINK The station transmits a signal called "Blink" when it's signal is not usable. Do not use this TD for navigation.

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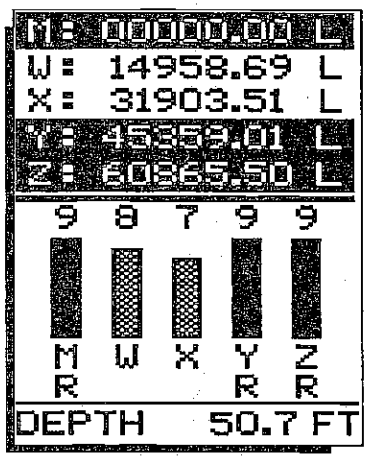


Below the station's TD's are the bar graphs showing the signal strength for each station. The number at the top of the bar graph shows the relative signal strength with 9 the maximum, or best and 0 the worst. Graphs that are solid represent stations currently in use by the loran. Again, in this example, stations Master, Y, and Z are currently in use. The letter "R" beneath the bar graphs signifies the stations the UltraNav recommends using. Finally, at the bottom of the screen, the water depth is displayed.

On this example, all stations are locked, with good signal strengths.

To exit this screen, press the MENU key and choose another one.

AUTOMATIC and MANUAL MODES

The UltraNav's Loran has both automatic and manual modes. Do not confuse this with the sonar automatic and manual modes. These are two independent features.

The UltraNav chooses the stations with the best crossing angles and signal strengths when it's in the automatic mode. It does this by continually monitoring the stations signals to determine the best ones to use. If the unit determines one or more stations are better to use than the current ones, it will automatically switch to the new stations.

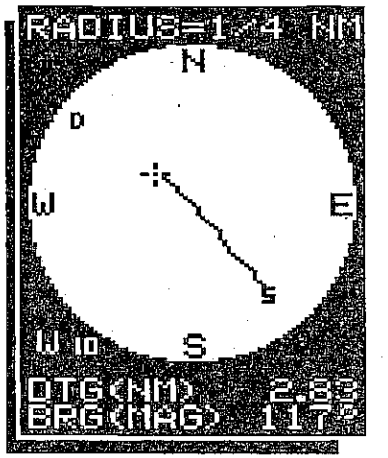
However, there are times when you don't want the unit to switch stations. When you're navigating using waypoints is one. You must use the same stations when travelling to a waypoint as the ones used when the waypoint was saved. For example, if the loran was using M,X, and Y when the waypoint was saved, you must use M,X, and Y to navigate back to that waypoint. Otherwise, navigation errors can occur. Placing the unit in the manual mode prevents the UltraNav from changing stations.

If your present position starts to move outside of the circle, the UltraNav will first clear the display for an instant. Then it will redraw your present position along with a portion of your track near the center of the screen. Your present position will always be on the plotter at all times. You do not have to recall a waypoint to use the plotter.

To clear the plotter, see the Plotter Menus section.

Using the Plotter with a Waypoint

Using the plotter with a recalled waypoint or route is an easy way to see the effects of wind and current on your boat. To use the plotter in this manner, simply recall a waypoint (see the Waypoint Recall section for more information), then press the PLOTTER key. A screen similar to the one below appears.



The "S" is your starting location. This was your position when you recalled the waypoint. The flashing cross is your present position, and the "D" is the destination. The destination is the recalled waypoint position. If you are using a route, it's the first waypoint location in the route. The dotted line is the direct path or course from the starting location to the destination. Follow this line to get to the waypoint. The destination waypoint number is displayed in the plotter's lower left corner. In this example, waypoint number 10 is the destination.

Distance To Go (DTG) and Bearing to waypoint (BRG) are displayed at the bottom of the screen when a waypoint is recalled.

An arrival alarm is available that sounds a tone when you come within a preset distance to the destination. See the section on alarms for more information on the arrival alarm.

PLOTTER MENUS

Pressing the MENU key while the plotter is displayed gives you a new set of menus, relating only to the plotter. A description of the menu functions follows on the next page.

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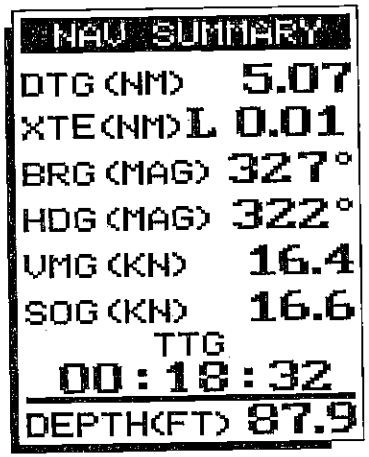


Bearing To Waypoint (BRG) is the third display, showing the direction to the recalled waypoint.

Heading (HDG) is the fifth item on the screen. This display shows your heading (direction of travel).

Velocity Made Good (VMG) is your actual speed toward the waypoint.

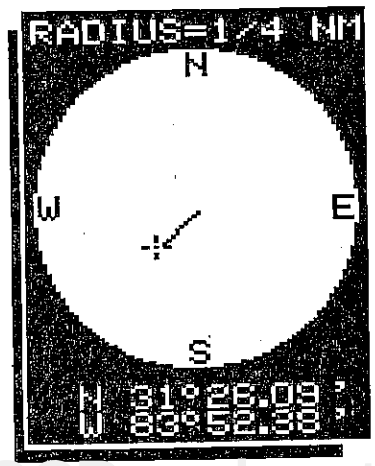
Speed Over Ground (SOG) is the averaged speed over ground that you are making. For example, if your boat speedometer says you are travelling at ten knots, but you're going head-on into a two knot current, then your speed over ground is eight knots.

Time To Go to waypoint is the time the UltraNav calculates it will take you to reach the recalled waypoint.

Water Depth is the last item on the Nav Summary Screen.

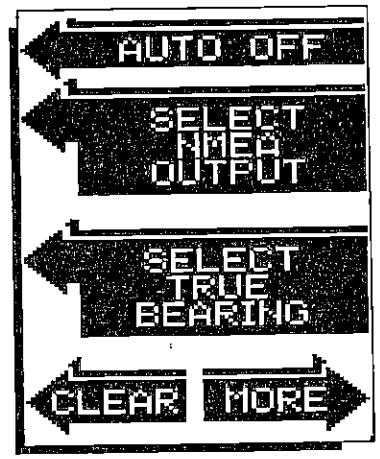
PLOTTER

The plotter lets you easily see your course and direction of travel on the screen. The plotter will also show your starting position and destination if you are travelling to a waypoint or on a route.



To use the plotter, simply press the PLOTTER key. A screen similar to this one appears.

The flashing cross is your present position. The solid line is your track, or path you have travelled. The circle is a compass rose with north, south, east, and west marked. The circle's radius is displayed at the top of the screen. Your present position is displayed at the bottom of the screen.



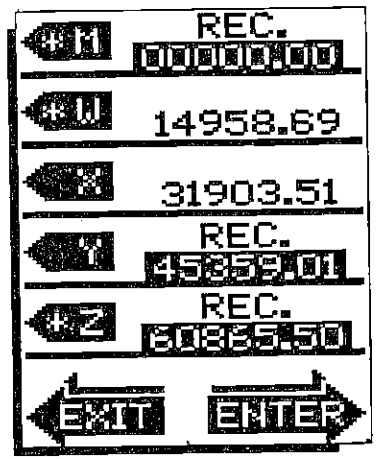
To place the UltraNav in the manual mode, first press the MENU key. Now press the key adjacent to the "CHANGE SETUP" label. Now press the MENU key two more times. The "AUTO OFF" label appears at the top of this screen. Now press the key adjacent to this label. The menus will disappear, switching to the last used loran screen.

The word "AUTO" or "MAN" appear at the top of the position screen, showing which mode is in use.

See the "Position Screen" section for more information.

MANUAL STATION SELECTION

The UltraNav's manual station selection feature lets you decide which stations to use. This also locks the unit in the manual mode.



To manually change stations, first press the MENU key, then press the key adjacent to the "CHANGE SETUP" label. Now press the key adjacent to the "SELECT LORAN STATIONS" label. The screen shown below appears. In this example, stations M, Y, and Z are in use (shown by the TD's in reverse video). The UltraNav also recommends using these stations. To change stations, simply press the keys adjacent to the desired stations. After each key is pressed, an asterisk "*" displays next to the station's letter, signifying the change. Press the key for all stations that you intend to use. In this example, the keys adjacent to stations M, W, and Z were pressed. After selecting the desired stations, press the key adjacent to the "ENTER" label. This activates your selection and returns the UltraNav to a loran screen. If the stations you've chosen are locked with good crossing angles, the unit should show a latitude/longitude position after a short wait.

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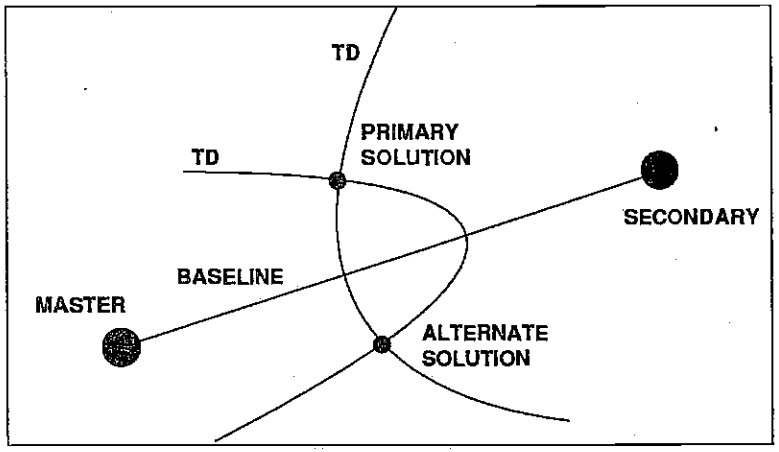
PRIMARY and ALTERNATE SOLUTIONS

The loran normally determines its position by measuring the time difference between the master and two other secondary stations. Each time difference results in a line of position. Your present position is the intersection of the lines of position. This is called a "fix".

A mathematical formula in the loran receiver uses TD's to determine the latitude/longitude position. Due to the nature of loran, your position in latitude/longitude can be on either side of a baseline. (The baseline is an imaginary straight line connecting the master and each secondary station.) It's possible for the loran to lock onto the stations, give good fix qualities and signal strengths, but show the latitude/longitude on the other side of the baseline from your present position.



These two positions (your present position and the one on the other side of the baseline) are called the primary and alternate solutions. They're usually far apart, making it easy to tell if the loran is displaying a position far from your actual location. However, if you're close to the baseline, the difference between the alternate and primary solution could be only a few miles, or less. For this reason alone, its always important to know your approximate position when initializing or using a loran.

To switch from the primary to the alternate solution, first press the MENU key. Next, press the key adjacent to the "CHANGE SETUP" label. Now press the key adjacent to the "MORE" label.

Distance To Go (DTG) is displayed immediately below the C.D.I. indicator. This is the distance from your present position to the waypoint. When the UltraNav is first turned on, the distance is shown in nautical miles.

The bearing to the waypoint from your present position displays at the center left side of the screen. The bearing is shown in degrees magnetic (MBRG) when the UltraNav is turned on for the first time. To switch to a true bearing display, see the "SELECT TRUE BEARINGS" section.

The waypoint you're currently using for navigation shows to the right of the bearing display.

The cross track error (XTE) displays at the bottom of the screen, right above the water depth display. This is the same distance as shown at the top of the screen by the C.D.I. display, only in digital numbers. When the UltraNav is first turned on, the cross track error displays in nautical miles.

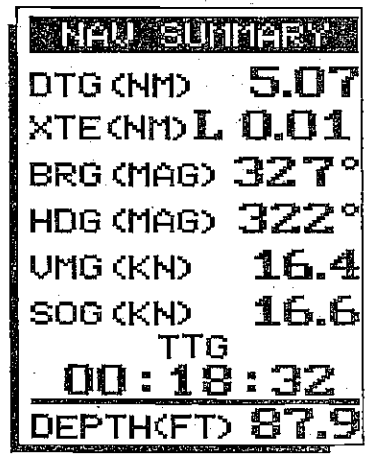
NAVIGATION SUMMARY SCREEN

This screen shows all navigation information to a waypoint in digital numbers. To display this screen, press the MENU key twice while the UltraNav is in the Loran mode. The screen shown below appears. Now press the key adjacent to the "NAV SUMMARY SCREEN". The following screen appears.

(Note: All features are in nautical miles, degrees magnetic, and knots when the UltraNav is turned on for the very first time.)

Distance To Go (DTG) shows at the top of the screen. This is the distance to the last recalled waypoint.

Cross Track Error (XTE) is the second item on this screen. Cross track error is the distance to the side of your desired course.



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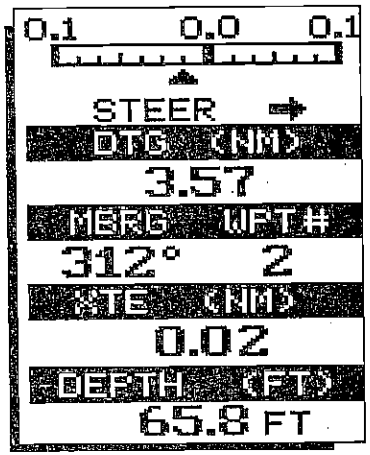
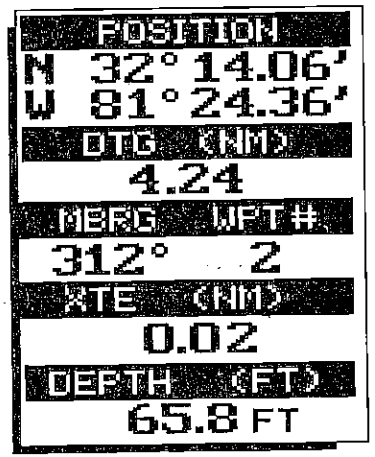
STEER INDICATOR DISPLAY and NAVIGATION DISPLAY

The steer indicator display shows steering, cross track error, distance and bearing to a waypoint. A waypoint must be saved and recalled to use this display.

The navigation display shows the same information as the steer indicator display except it shows the present position at the top of the screen instead of the steering indicator.



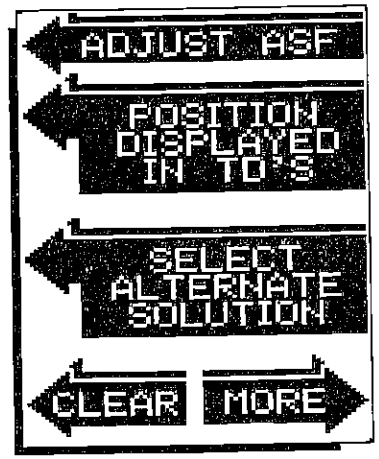
STEER INDICATOR SCREEN



NAVIGATION SCREEN

The course deviation indicator (C.D.I.) is at the top of the steer indicator screen. This shows the cross track error distance in nautical miles you are to the side of your desired course. (The course is an imaginary line drawn between your starting location and the destination.) For example, you are a tenth of a mile to the left of course if the C.D.I. arrow points to the 0.1 mark on the left side of the scale. A message also appears "STEER >", telling you which direction to steer the boat to get back on course.

The C.D.I. range is 0.1 nautical mile when the UltraNav is turned on for the first time. To set it to a different distance, use the C.D.I. alarm adjust menu. The C.D.I. range and alarm are the same. For example, if the C.D.I. range is one mile, then the C.D.I. alarm will sound if you are off course one mile or more. See the ALARMS section for information on setting the C.D.I. alarm.



This menu appears. Finally, press the key adjacent to the "SELECT ALTERNATE SOLUTION" label. The UltraNav returns to a loran screen after this selection. If you're using a screen with the latitude/longitude displayed, the lat/long will flash until a new position displays. If the unit doesn't show the proper latitude/longitude position, you may have to change stations, then try switching the primary and alternate solutions.

The solution currently in use by the UltraNav is displayed at the top of the position screen. See the "Position Screen" section for more information.

Check your position against the loran after it displays a new latitude/longitude. They should be the same. If so, use the loran and navigate normally.

To switch back from the alternate to the primary solution, repeat the above steps. The only difference is the menu label reads "SELECT PRIMARY SOLUTION".

SHOW TD'S

The UltraNav shows either latitude/longitude or time differences (TD's) on most screens. To switch between latitude/longitude and TD's, first press the MENU key, then press the key adjacent to the "CHANGE SETUP" label. Now press the MENU key once. The screen shown above appears. In this example, the UltraNav is displaying the position in latitude/longitude. To change to TD's, press the key adjacent to the "POSITION DISPLAYED IN TD'S" label. The UltraNav will revert to the last loran screen and show the position in time differences. To switch the display again, simply repeat the above steps. The menu will now read "POSITION DISPLAYED IN LAT/LON". Press the key adjacent to this menu to get latitude/longitude displays.

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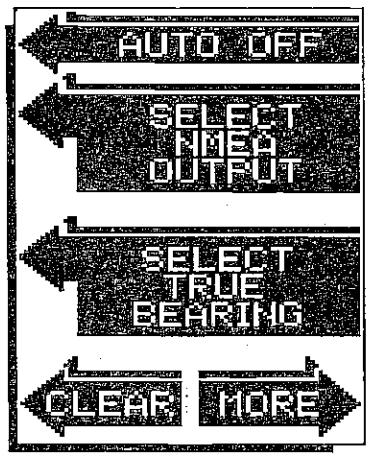
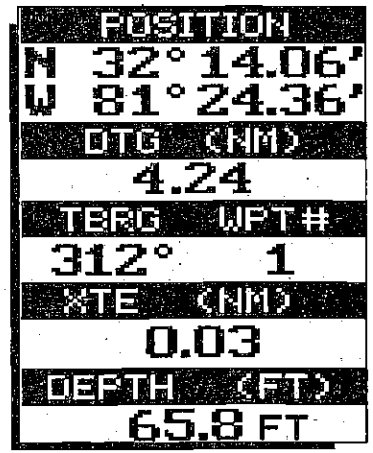
TRUE and MAGNETIC POSITION

Most navigators realize there is a difference between true and magnetic north. True north is the top of the world. It's where all lines of longitude converge. Magnetic north is the location our compasses point. It lies several hundred miles to the south of true north, at a location in Canada.

Charts are usually laid out according to a Mercator projection which uses true north. If you plot a course on a chart using the Mercator projection, you'll either have to convert magnetic readings to true or use true readings.

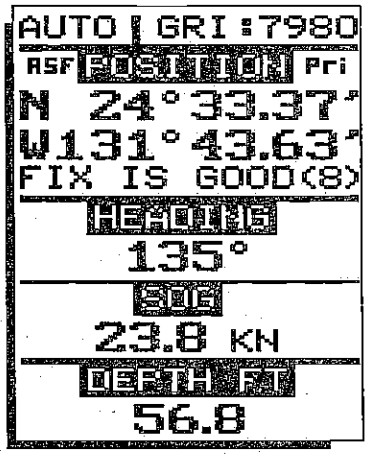
The UltraNav can display navigation information in magnetic or true. When it's turned on for the very first time, magnetic is used. To switch to true, press the MENU key, then press the key adjacent to the "CHANGE SETUP" label. Now press the key adjacent to the "MORE" label two times. The menu shown below appears. In this example, magnetic is in effect. Press the key adjacent to the "SELECT TRUE BEARING" label. The screen will clear and return to the last used loran screen, showing all navigation information in degrees true. Repeat these steps to switch back to magnetic. The menu that originally said "SELECT TRUE BEARING" now reads "SELECT MAGNETIC BEARING".





TRUE BEARING (TBRG)

POSITION DISPLAY



The position display shows your present position, heading, speed over ground, depth, and status displays.

The GRI in use and the mode (automatic or manual) display at the top of the screen. Immediately beneath these is the present position display. It shows your present position in either latitude/longitude or TD's. To the left of the word "POSITION" is the ASF indicator. It only shows when ASF's are in use. On the far right is the primary/alternate solution display. If the unit is in the primary mode, the letters "PRI" appear. "ALT" appear if the unit is in the alternate mode. In this same area is the fix quality indicator. Fix quality is a measure of the lines of position's crossing angles. If the fix quality is poor, use the displayed information with caution. The displayed position can and will vary with poor crossing angles. The position display flashes the last known position when the fix quality is not usable. A number to the right of the fix quality message shows the fix quality's value. It's range is from zero (0) to nine (9), with zero the worst and nine the best.

Remember, *do not use the loran for navigation when the position display flashes*. Find and correct the problem before navigating with the unit.

Beneath the fix quality message is your heading, or direction the boat is travelling. Speed over ground (SOG) shows your actual speed, regardless of the speedometer reading. For example, if you're travelling at ten knots directly against a two knot current, then your speed over ground is eight knots. You will typically need to travel some distance in a straight line before the SOG feature "settles down" and gives an accurate reading.

The last display on this screen is the digital depth display.

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